

## GENERA AND SUBGENERA IN CLASSIFICATION AND NOMENCLATURE

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The recent literature on zoological classification and nomenclature is so rich, that it may seem doubtful if some basic questions on these matters are still in need of being dealt with. As ichthyologist, I am considering them from the point of view of a student of modern fishes; from my own experience in this field, some opinions arise that my colleagues specialized otherwise will perhaps share only in part or not at all. The important change in the taxonomic concepts that developed in modern times attracted the attention of biologists on the problems of species, subspecies, populations, etc. However, it is more and more important to consider carefully also the higher categories.

Let us deal with the genus. Surely, to day all zoologists share Linnaeus' opinion, admitting that this taxon includes one or more species having the greatest possible number of common characters. We currently speak of genera and generic differences, but—as it is well known—they cannot be defined by objective criteria: the genus is something artificial and leaves much room for personal interpretations. In all the zoological groups many old genera have been more and more split and some modern students have gone so far that a great number of monotypic genera have been established on the basis of trivial morphological characters.

There are "genera" of Percoid fishes proposed just because the "type species" shows small differences in the numbers of the fin rays, the development of fin lobes, the size of the scales or the teeth, etc. Such a procedure makes us wonder what is the value of the genus and where lies the difference between generic and specific characters.

A purely morphological concept of the genus is probably responsible for a so regrettable abuse. If this taxon has to keep a meaning, it must be or aim to be a biological unit also: ethological and ecological features are important as the morphological ones. Let us quote a few significant cases from the Mediterranean fishes. When we say that *Germo* cannot be separated from *Thunnus*, *Smaris* from *Maena*, *Coricus* from *Crenilabrus*, we point out that in such pairs of "genera" recognized by the former ichthyologists there is a basic similarity of structure and way of life. Similar cases are easily found in other groups of animals, as the ducks (*Mareca*, *Dafila* and *Querquedula* are simply *Anas*) and the deers (*Sika*, *Panolia*, *Rusa* are really *Cervus*). On the other hand, there are excellent examples of genera, the validity of which is well supported also on biological grounds. *Salmo* and *Oncorhynchus* among Salmonidae, *Clupea* and *Alosa* among Clupeidae show, beside morphological features, a different behavior concerning the migratory habits; a geographical separation, however not complete, is to be added in the former case.

If we could extend this sampling and pay a more careful attention to genera or groups of genera, it would appear that the evidence of the "generic characters" of different kinds is not all correlated: in some cases the morphological ones are outstanding, in others they are rather poor but the biological ones are very remarkable.



If we give it a wider interpretation, the genus looks less artificial and express in a better way an objective phenomenon, that is the existence of groups of related species. I avoid stating that "lumpers" or "splitters" are to be preferred: both procedures may be right and both may be wrong. For the same reason, we cannot prefer "large" or "small" genera. It may only be stated that the smallest the genus, the wider must be the gap that separates it from the near ones. What really matters is to define genera as groups of species morphologically and biologically related, having gone through a long process of adaptation to a peculiar environment and way of life. So, the genus gets an evolutionary meaning, being correlated with the phylogeny of the included species.

It has been stated rightly that systematists must be increasingly interested in the behavior of the species, as they will find very useful criteria for taxonomic grouping. This has already been proved by observations on birds and insects, in which some relationship problems have been solved with the help of ethology; generally speaking, however, the behavior has been very little considered in connection with the definition of genera. Of course, it is not easy to follow consistently a procedure rigidly adherent to the views here referred to, as in many cases a student will be compelled to describe a new genus, at least provisionally, on a merely morphological basis: it is just what still happens for the species, notwithstanding so many talks on the "new systematics". Anyway, a concept of the genus as a morpho-biological unit must be kept in mind when critical or revisional work is done. This taxon will then attract the interest of the general biologists, who now chiefly consider the lower systematic units. Among the many problems concerning the species, that of their relationship is outstanding and here the genus comes necessarily into discussion.

Turning to a related question, we may state that if subgenera are admitted—and they are indeed—they are to be defined according to the same basic concepts. Subgenus is a group of species which show a closer affinity, proved by morphological and biological characters. Let us remind that among the latter, the geographical distribution is important. Too often the subgenus appears as something of very uncertain meaning and value, just as a compromise between recognizing or not a new taxon of generic rank. Here are very frequent cases in which the artificiality of the classificatory system is well apparent. On the other hand, it does not seem possible to establish rules for distinguishing genera and subgenera: this is a matter left to the judgment of the specialists. I will simply say that if we go on with the definitions of subgenera based on very trivial features of some species, we may wonder if such a taxonomic category really deserves to be kept.

Our zoological nomenclature must express the result of the classificatory work and it is quite sure that a better situation in both nomenclature and classification arise when: 1) no names are created for units unacceptable on classificatory grounds; 2) no changes of well known names are too freely effected for purely nomenclatorial reasons.