USE OF THE INTERNATIONAL CODE IN NAMING OF SPECIES

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ABSTRACT

The binomial method of zoological nomenclature originated in works written in Latin, but is invaluable now that species are described in many languages. The law of priority is an essential principle in present usage.

Generic names are based on a type-species. Generic limits have progressively become narrower over the past two centuries and this is illustrated by reference to four check-lists of British species spanning 150 years. The principles involved are illustrated by consideration of the generic placement of Javesella pellucida (Fabricius) and of the identity of the Cicadella genus.

Specific (or trivial) names are based on the identity of a type-specimen. This name may be a Latin adjective or noun: only in the former case is the ending altered depending on the gender of the generic name. Problems have also arisen out of re-examination of old type-specimens and due to arbitrary guesses by authors and cataloguers. Some examples are given.

INTRODUCTION

The idea of naming all plants and animals using a binomial (two word) description originated with Linnaeus and the present system of zoological nomenclature dates from the tenth edition of his Systema Naturae published in 1758. Like the majority of scientific works of that period, it was written in Latin, a language still used by some writers in smaller countries, e.g. Horváth in Hungary and Reuter in Finland, up to about 80 years ago. Now taxonomic works are written in many languages and alphabets, but the Latin binomial name of a species is recognised throughout the world, making species recognition much easier.

Around the middle of the last century it was becoming apparent that a code of practice was necessary in zoological nomenclature, and from early statements of broad principles we have reached the detailed code, published in both English and French, in use today. The essential pillars of the code are the law of priority, stating that the earliest valid name given to a taxon must be used, and the law of homonymy, that no two genera in the animal kingdom shall have the same name and that similarly no two species within the same genus should have identical names.

THE GENERIC NAME

The basic concept

The generic name, the first half of the binomial, is written commencing with a capital letter and is based on a designated type-species. Nowadays, anyone describing a new genus must specify the type-species: genera described in the past have, where necessary, been allocated these by subsequent authors, from among the species originally put into the genus. When a genus is split, the original name must remain with the type-species, providing that it continues to satisfy the law of priority.

The narrowing generic concept

Linnaeus's original insect genera were broad in their concept and all Auchenorhyncha were initially placed in the genus Cicada. Later he separated Fulgora, but these were the only two genera recognised for much of the eighteenth century, and were similar in their scopes to the series Cicadomorpha and Fulgoromorpha today. In the nineteenth and twentieth centuries, the generic concept has become progressively narrower, resulting in a proliferation of new genera. The result is illustrated in Table 1, showing the analysis of four check-lists or major works on British species published over a span of nearly 150 years.

TABLE 1.

Analyses of check-lists and major works on British Auchenorhyncha

Author and date	Number of species	Number of genera	Average number of species/genus
Curtis, 1837	144	27	5.33
Edwards, 1894 - 1896	268	48	5.58
China, 1950	340	100	3.40
Le Quesne & Payne, 1981	365	144	2.53

The increase in the number of genera recognised in this century has been primarily due to the studies of Ribaut on the Deltocephalinae, Dlabola on the Typhlocybinae and Wagner on the Delphacidae.

This proliferation of genera has naturally caused many changes in the generic names of the species, so that at times it becomes difficult for the non-specialist to recognise the species that he or she is dealing with.

Generic placement of Javesella pellucida (Fabricius)

We can see how some of these principles have operated in tracing the generic names that have been used for the species Javesella pellucida, a common Delphacid that occasionally is a pest and virus vector in cereals. It was originally described by Fabricius in 1794

as Fulgora pellucida. The type-species of the genus Fulgora Linnaeus has now been designated as Fulgora lanternaria, a conspicuous Oriental species.

The genus Delphax was described by Fabricius in 1798 and its original concept corresponded essentially to the family Delphacidae of today. In fact, this is the Greek word for dolphin and was regarded at one time as a homonym of the name used in the Mammalia by Walbaum. The latter use was declared invalid in an opinion of the International Commission on Zoological Nomenclature and the name Delphax thus validated for the insect. The type of Delphax was fixed by the Commission as D. crassicornis (Panzer).

Fieber, writing in the 1860s, described many European Delphacids and gave good drawings of the external male genitalia: he ascribed many of the smaller species to the subgenus Delphacodes, which was subsequently raised to generic level and the species D. mulsanti designated as type-species by Kirkaldy. The generic names Calligypona, described by Sahlberg in 1871, and Liburnia, raised by Stål in 1866, have also been used for pellucida: the type-species of the latter is the African species L. vitticollis (Stål) and the genus is not now regarded as including any Palaearctic species.

When I came to look at the British Delphacids in the 1950s, there was an assemblage of about thirty species which could be referred to either Delphacodes or Calligypona. There was disagreement in the literature over a critical character in the type-species Delphacodes mulsanti and I was unable to obtain the type-specimen of this non-British species from Paris Museum. I therefore accepted Dr. China's opinion on this, including pellucida in Delphacodes, wrongly as it subsequently turned out when the type-specimen was re-examined by Dlabola. However, in 1963, Wagner published a paper in which the Central European species of this assemblage were fragmented into eighteen genera, most of them new, including Weidnerianella with pellucida as type-species. However, Fennah also published a paper in the same year describing a few new genera of economic importance, including Javesella with the same type-species. Thus the law of priority became all-important in deciding which publication came out first. Fennah's came out in February 1963 and although the nominal date of the journal in which Wagner's paper appeared was December 1962, it was not actually available until April 1963. And so Javesella is now the correct generic assignment for this species.

The Cicadella genus

Another complex story is involved in the correct use of the generic name Cicadella, used by both Duméril in 1806 and Latreille in 1817: subsequent type-species fixations had resulted in its being used in two different senses, in different subfamilies of the Cicadellidae. The story is an involved one, summarised by China (1961), finalised by the International Commission suppressing the earlier use by Duméril and validating that of Latreille: details can be obtained by reading this publication. The misfortune is that the decision on this matter came so late, after several major works had used the

name Cicadella for the genus known before 1940 and after 1961 as Eupteryx.

THE SPECIFIC NAME

The basic concept and grammatical considerations

The second part of the binomial is the specific or trivial name: I prefer the former description, since the latter may be confused with the commonly used name in a modern language (e.g. common frog-hopper). Just as when surnames had to be found for people, John, for example, might become John Small, John (the) Tailor or John (of) Watford, species within a genus of cocoon-spinning moths similarly might receive the corresponding Latin epithets parvus, sartor or watfordi. Note that the latter is correctly spelt, like all specific names, without a capital letter.

At this stage, some knowledge of Latin grammar becomes essential, although the language is far less widely taught than it was in previous centuries. All generic names are treated as Latin nouns in the nominative case singular and may have masculine, feminine or neuter gender: sometimes this is set by classical usage and sometimes this is fixed by the author describing the genus either expressly or by usage. The specific name may be an adjective like parvus, a noun further qualifying the generic name like sartor (the grammatical term is a 'noun in apposition') or a noun in the genitive singular or plural, suggesting place of origin like watfordi (an alternative would be the adjective watfordensis), food plant e.g. urticae or urticarum ('of nettle' 'of nettles') or in honour of some person like martini. The problem is that adjectives must agree in gender with the generic name while all noun forms of the specific name are invariant. Thus in practice we have to use parvus, parva or parvum (or their diminutive forms parvulus, parvula and parvulum), depending on whether the generic name is masculine, feminine or neuter, and in the latter case watfordensis becomes watfordense.

These grammatical rules become important when moving species from one genus to another. For instance, when moving Calligypona leptosoma into the masculine genus Florodelphax, some authors have altered the specific name to leptosomus, unaware that leptosoma is a noun derived from two Greek roots meaning a slender body.

A species name is associated with a type-specimen, which must be designated by anyone describing a new species today. For species described earlier, a lectotype (chosen type) must be selected out of the material in the original author's collection, if at all possible: the specimen should be labelled as such as its location published. Ideally, anyone working on the taxonomy of a group should look at the type-specimens of each species, to make sure that they have not been misinterpreted by earlier authors, but this is not always very practical

The identity of Florodelphax leptosoma (Flor)

Occasionally, misinterpretation of a species can cause serious confusion. For instance, Linnavuori (1951) looked at two Delphacids

now put into the genus Florodelphax and concluded that the name leptosoma, described by Flor from Latvia, had been wrongly used by British and French entomologists, based on his interpretation of Flor's description and his knowledge of the distribution of the species in northern Europe: he remarked that he had not had the opportunity to study Flor's type. In fact, Vilbaste (1960) studied the types in Flor's collection some nine years later and found that Linnavuori had been wrong in his deductions and that the earlier British and French entomologists had used these names correctly. Misinterpretations of this sort can lead to much confusion in the literature.

Doubtful attributions - Empoasca solani (Curtis)

Another possible cause of occasional confusion is the dislike of some cataloguers for a doubtful attribution. For instance, earlier cataloguers had marked Eupteryx solani Curtis, 1846, described in an English gardening journal, as doubtfully synonymous with Empoasca pteridis (Dahlbom, 1850), but Metcalf (1968) and Nast (1972) use the Curtis name unquestioningly, based on the law of priority, presumably because this is the species normally found on potato on the Continent. However, in England other Empoasca species have been found on potato and my suspicion is that examination of Curtis's material might shuffle the names around again.

Likewise in his valuable works on the French fauna, Ribaut did not check the identity of some established species from which he separated new sibling species, resulting in subsequent name changes when the types were re-examined by other workers and Ribaut's assumptions proved wrong.

Inappropriateness - Cicada flavescens Fabricius

The name flavescens, based on Cicada flavescens Fabricius, 1794 was for many years applied to the Empoasca species now known as vitis (Göthe) before Wagner re-examined the type and found that it was actually an Edwardsiana. The Latin name flavescens, meaning yellowish, is certainly more applicable to its present usage, since the Empoasca species are green, but I may remind you that a name does not become invalid if afterwards shown really to be inappropriate: other examples might be attribution to an incorrect food-plant or country of origin. Some cynics might quote Homo sapiens as a case in point!

Homonymy - Cicada plebeja Fallén

The law of homonymy is applied strictly even in cases where confusion could no longer occur. For example, the species long known as Euscelis plebejus had to have its specific name changed to incisus (Kirschbaum) when it was realised about twenty years ago that it was based on Cicada plebeja Fallén, 1806 and that this name had been previously used by Scopoli in 1763 for a Cicadid. So although no one in the past 150 years would have placed these two in the same genus, the name plebejus had to be discarded in the case of the Euscelis and the next available name used.

QUOTING OF AUTHORS

It is good practice to quote the author of a specific name, at least when mentioning it for the first time in a publication: it is often useful to add the year of the description separated from the author's name by a comma. Examples can be seen earlier in this paper. A widely accepted convention today is that the author's name, together with the year if quoted, is put into parentheses if the generic name which you are using is not the same as the generic name used by the original describer of the species.

FINAL REMARKS

I hope that these remarks and examples give those of you less versed in nomenclatural problems some insight into what is involved. Moreover, I suggest that almost all of us can make better use of the International Code of Zoological Nomenclature, the International Commission and the advice of classical scholars in our taxonomic problems.

A number of amendments to the Code were approved by the International Congress in 1972, when publication of a third edition of the Code was proposed, but this has not yet taken place. I have included in the references three books (Brown 1954, Jaeger 1978, Nybakken 1970) which provide useful references for those of us not well versed in the languages of Latin and Greek.

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