VERBAL STEMS IN LATIN COMPOSITION

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The use of Latin verbal stems in formation of modern Latin specific epithets in species names is a continuing source of perplexity to those dealing with biological nomenclature. Are compound words having a verbal stem as the final component to be identified as adjectives or as nouns? A review of classical and modern uses of the Latin verbal stem col derived from the verb colo (to dwell, to inhabit) will illustrate. In modern Latin are found compound specific epithets which have -cola, definitely regarded as a noun ending, as the last component; others in which the ending is adjectival in form, often with the neuter ending (-colum). It is contended, since there is no classic Latin precedent for formation of such adjectival compounds of col-, that words adjectival in form should be corrected to nouns ending in -cola. This view is widespread among botanists. It may be illustrated by a quotation from Wakefield and Moore (1):

"With regard to the species of Myxosporium causing canker of apple, since the mistake is so often made, it seems desirable to point out that the specific epithet should be corticola and not corticolum, as was wrongly used by Edgerton. Latin words ending in -cola, as incola, agricola, terricola are not adjectives but nouns of common gender, formed from the stem col-. There is no corresponding adjectival form. The specific epithet corticola is thus a noun in apposition, meaning an inhabitant of the bark; it cannot be declined like an adjective."

This point of view agrees with the opinion of many botanists, who regard the formation of compound adjectives with endings -colus, -cola, or -colum as solecisms which should be corrected.

Classic Latin precedent should be determined. Gradenwitz, in his Laterculi vocum latinorum (1904) lists 40 Latin words which end in -cola; all are nouns of masculine or common gender. No Latin words with the stem col end in -colus or -colum.

Several questions should be answered.

1. How consistently have biologists, in compounding specific epithets, followed the Latin precedent of using the verbal stem col only as -cola to form masculine or commongender nouns? A study of 1006 microbiological specific epithets which included the verbal stem col in the final component reveals the following:

- a. Specific epithets ending in -cola associated with feminine generic names. Inspection in this case cannot determine whether the specific epithet is a noun in apposition or a modifying adjective, there is no difference in spelling; 775 specific epithets of the total 1006 are in this class and cannot be identified by observation.
- b. Specific epithets ending in -cola associated with masculine or neuter generic names. These are, of course, nouns in apposition; 117 of the total number of epithets studied belong here.
- c. Specific epithets ending in -colus or -colum. Two epithets ending in -colus following masculine generic names and 112 ending in -colum following neuter names were definitely indicated as adjectives by their authors. A total of 114 epithets appear in this category.

In summary, of the 231 identifiable specific epithets, about half (117) could be recognized definitely as nouns, and half (114) as adjectives. The list was from names of microorganisms only (fungi, algae, and bacteria), with no ferns or flowering plants. In all but two cases the adjectival specific epithets were neuter.

It is evident that in fields such as mycology, the Latin precedent of always forming nouns ending in -cola to be used as specific epithets has been frequently disregarded.

2. Should the adjectives ending in -colus and -colum be regarded as solecisms to be corrected to nouns ending in -cola? Several items should be considered.

- a. The custom of using the adjectival form seems well

BACTERIOLOGICAL NOMENCLATURE
AND TAXONOMY

established, particularly with neuter generic names. It is evident that the adjectival form, rather than the noun, has been chosen deliberately. The suggestion made by one philologist that the use of the adjectival forms -colus, -cola, -colum may be due to confusion with the diminutive endings -culus, -cula, -culum displays an unwarrantedly gloomy view of biological Latin and can be dismissed as wholly improbable. It has also been suggested that many of the adjectives originated with Saccardo and are to be regarded as "the coinage of one notoriously inept in his Latin."

- b. All nomenclatural codes forbid a change in spelling except in a clear case of a lapsus or an unintentional orthographic error. There is no code provision that classic usage for each verbal stem must be followed. There seems to be no legal warrant for correction, even though such may be assumed as necessary by some workers.

Very commonly Latin verbal stems other than col are used in the construction of modern Latin specific epithets. This custom is well explained by Clements (2) in his analysis of the formation of compounds from Latin stems. He says of such compounds:

"If the last term is a verbal stem, the compound may be a noun of the first or third declension, or an adjective of three terminations or one termination."

Clements clearly recognized the formation of both nouns and adjectives from any Latin verbal stem as legitimate.

In modern languages having large Latin content, as English, the Latin verbal stem is regularly used in formation of adjectives derived from the Latin, as in arenicolous, limicolous, lignicolous, and silvicolous. It may be contended that to forbid the formation of similar modern Latin adjectives may be quite unrealistic.

2. Do the same problems noted above, arise when verbal stems other than col are employed in forming modern Latin compounds to be used as specific epithets? Did the Latins treat all verbal stems in the same manner? Several such

stems may be examined, some used extensively by the Latins as well as in modern word formation. The following additional verbal stems will be noted: ceps, cid, fer, fex, fic, frag, fug, gen, ger, par, vag, and vor. It is believed that this list constitutes a representative sample. The data with reference to use of these verbal stems are taken largely from the "Laterculi" of Gradenwitz.

Ceps, cipis from capio (to take into possession, to accept)

Masculine nouns as manceps (hand taker, purchaser) and adjectives with a single ending as princeps (first taken, first) were used by the Latins. Such words were rather rarely formed, perhaps because of the confusion with nouns and adjectives ending in -ceps, -cipitis derived from the noun caput, capitis, the head. Two adjectives only, ending in -ceps, -cipis, have been found among modern microbiological specific epithets, princeps and pseudoprinceps. All other specific epithets ending in -ceps have cipitis in the genitive, and are derived from caput. Of these, 65 are adjectives, one is a noun.

Cid from caedo (to cut, to kill)

There is 1 masculine Latin noun ending in -cidus (muricidus mouse killer, coward); and 16 masculine or common Latin nouns ending in -cida (as matricida mother killer). There are no Latin adjectives ending in -cidus, -cida, -cidum. Perhaps such were avoided because of the existing adjectives with which they might be confused, such as acidus, lucidus derived from other stems.

A total of 26 words used as specific epithets in composition of modern Latin specific epithets have as a final component an ending derived from cid. Of these, 13 end in -cida and are associated with feminine generic names; whether these are intended to be nouns or adjectives cannot be determined. Nine end in -cida and are used with masculine or neuter generic names; these specific epithets are definitely labeled as nouns. Two end in -cidus (with a masculine generic name) and two in -cidum (with a neuter generic name) and seem definitely to be intended as adjectives. Usage both in classic and in modern Latin seems to emphasize the formation of nouns of masculine or common gender ending in

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

-cidus, -cida, or -cidum. This usage closely parallels that of -cola.

Fer from fero (to bear, carry)

Gradenwitz lists 193 Latin words which have fer in the last component. All but three are adjectives with three endings, -fer (or -ferus), -fera, -ferum. Three feminine nouns end in -fera, i.e., flabellifera, conifera, and profera. In a list of 240 modern Latin specific epithets with a final component derived from fer, 45 end in -fer and 5 in -ferus following masculine generic names, and 53 in -ferum following neuter generic names. It is possible that some of these specific epithets may be interpreted as nouns, but self-evidently modern usage is quite definitely in accordance with Latin precedent, i.e., compounds formed from the verbal stem fer are usually adjectives. However, there are 2 cases in which specific epithets ending in -fer follow neuter nouns (as in Triceratium rotifer) and 2 in which words ending in -fera follow neuter nouns; such specific epithets may be regarded as nouns. Biological custom is quite definitely oriented to formation of adjectives from the verbal stem fer.

Fex, ficis from facio (to make, to produce)

Twenty-two Latin nouns end in -fex, all with the meaning of maker or producer. There are no adjectives. Two modern Latin specific epithets have been noted, flaccidifex and spinifex. They may be regarded either as nouns or adjectives. Spinifex, Tubifex, and Pontifex are among generic names recognized.

Fic from facio (to make, to produce)

One hundred and one Latin adjectives end in -ficus, fica, ficum and 7 Latin nouns end in -fica. Of 13 specific epithets in modern Latin, all may be regarded as adjectives, 3 ending in -ficus, 6 in -fica, and 4 in -ficum. In microbiology, particularly in bacteriology, the participial form -ficans seems to have preference, 16 specific epithets with this ending have been noted.

Frag from frango (to break)

Three Latin nouns end in -fraga (calcifraga, ossifraga, and saxifraga). One Latin noun ends in -fragus (ossifragus). Eight Latin adjectives end in -fragus, -fraga, or -fragum. Of 4 specific epithets in modern Latin, three are neuter adjectives; one following a feminine generic name ends in -fraga and may be regarded either as a feminine noun or an adjective.

Fug from fugio (to flee)

There are 13 Latin nouns which end in -fuga, as lucifuga (one who shuns light), and profuga (a refugee, a fugitive). Latin nouns ending in -fuga have common or masculine gender. Four Latin adjectives end in -fugus, -fuga, -fugum, as lucifugus (light shunning) or profugus (banished, fugitive). Among 6 specific epithets, one adjective, solifugus, can be identified, as also the noun transfuga. The remaining 4 end in -fuga and may be regarded either as nouns or adjectives.

Gen from gigno (geno) (to beget, to bear, to produce)

There is also the Greek stem gen (from gennēo to beget, to bear, to produce) to be found in many Greek words. The Latin stem appears in the last component of compounds in the form of the adjective endings -genus, -gena, -genus or as the noun ending -gena. The Greek stem usually appears in adjectives ending in -genēs, -genēs, -genēs and in nouns ending in -genēs. Three words in Harper's Latin dictionary which end in -genes (primigenes, trigenes, and monogenes) are taken from the Greek.

There are 32 Latin adjectives ending in -genus, -gena, -genum and 37 Latin nouns which end in -gena. There are no Greek words ending in -genus (-genos). There are 199 Greek adjectives (Buck and Peterson(4)) which end in -genes.

In a list of 177 specific epithets ending in -genes, -gena, -genum of Latin derivation, 175 are probably adjectives, 2 are nouns ending in -gena. Of the 175 adjectives, 99 are compounds in which the first component has a Latin stem, and 76 a Greek stem. Of the 73 adjectives ending in -genes, 55 have first components with Greek stems and 18 with Latin stems.

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

While in classic Latin adjectives from the verbal stem gen in the final component end in -genus, -gena, or genum, and while in classic Greek, adjectives from the stem gen in the final component end in -genes, little attention has been paid to classic usage in the formation of modern Latin specific epithets, and both Latin and Greek suffixes have been added to Latin and to Greek stems.

Ger from gero (to carry, to bear)

Not all Latin words ending in -ger are derived from -gero. Nearly all with the verbal stem -ger end in -iger. Of these, about ninety adjectives end in -ger (2 in -gerus), -gera, -gerum. Several nouns end in -ger. Of 87 specific epithets noted from the verbal stem -ger, 14 are adjectives ending in -ger, 4 in -gerus, 50 in -gera, and 19 in -gerum. No nouns ending in -gera are noted with certainty.

Par from pario (to bring forth, to bear)

Eight Latin adjectives end in -parus, para, parum, and 3 Latin nouns in -para. Of 12 specific epithets noted, all are probably adjectives ending in -parus, -para, -parum, though some of the 6 ending in -para might be interpreted as nouns.

Vag from vagor (to ramble, to wander)

There are 23 Latin adjectives ending in -vagus, -vaga, -vagum. No Latin nouns end in -vaga. Of 5 modern Latin specific epithets noted, none is a noun ending in -vaga, 1 is an adjective ending in -vagus, 2 adjectives end in -vaga and 2 in -vagum.

Vor from voro (to devour)

Three Latin adjectives end in -vorus, -vora, -vorum (as carnivorus flesh-eating). Of 39 modern Latin specific epithets, 9 are adjectives, ending in -vorus, 19 ending in -vora are probably adjectives, possibly nouns in part, 11 end in -vorum and are adjectives.

A sampling of compound verbal nouns and adjectives from Latin and modern Latin (specific epithets) suggests the following:

1. The Latins formed compounds adjectives and nouns in which the final components were derived from many verbal stems.

2. From the verbal stems col and cid they uniformly derived nouns ending in -cola or -cida. However, in modern Latin there are many specific epithets including col or cid which were definitely fixed by their authors as nouns, in other cases as adjectives. Is the adjectival ending to be regarded as an orthographic error and corrected? Among botanical nomenclators dealing with higher plants there is a tendency to change all such adjectives (even hundreds in number) to nouns conforming to Latin precedent, to treat adjectives as solecisms or unintentional orthographic errors and to correct them. For example, it is urged that all specific epithets which end in -colum (of which there are many among the fungi) and agree as adjectives with the neuter generic name should be corrected to nouns ending in -cola in apposition with the generic name. Are such changes warranted?

3. In use of most other important verbal stems (as fer, fic, frag, fug, gen, ger, par, vag, vor) in the final components of compounds, the Latins developed both adjectives and nouns in the fashion outlined by Clements, forming nouns of the first or third declension or adjectives of three terminations or one termination.

4. In classic Latin there appears to have been no rule consistently applied to determine whether compounds formed with a verbal stem in the last component are to be treated as adjectives or nouns. From some verbal stems custom dictated that only nouns should be formed, from some others predominantly adjectives, from others both nouns and adjectives. In coining new epithets or in recognizing old epithets formed from verbal stems, must the classic treatment of each verbal stem be recognized, or may one form epithets from all verbal stems either as nouns or adjectives?

BACTERIOLOGICAL NOMENCLATURE
AND TAXONOMY

5. The Botanical and the Bacteriological Codes clearly state that changes should not be made in the spelling of words when the spelling used was the clear intent of the author.

6. The extent to which changes would be required in words which in microbiological literature show clear departure from classic precedent may be well illustrated by consideration of modern Latin words which have in the final component the verbal stem gen. The Latins invariably used the endings -genus, -gena, and -genum in formation of adjectives, the Greeks as consistently used -genēs, -genēs, and -genēs in the formation of Greek adjectives. Classically, -genus, -a, -um should be used in formation of adjectives from Latin stems and -genēs, -ēs, -ēs for adjectives from Greek stems. However, the endings in practice are used quite interchangeably, both forms with either Greek or Latin first components.

7. Various proposals may be made to end misunderstanding and to further uniformity.

- a. It might be ruled that each modern Latin compound specific epithet including a verbal stem in the last component shall end in a, be regarded as a masculine or common noun in apposition with the generic name. This would be consistent with classic Latin usage for a few verbal stems such as col and cid but would be clearly inconsistent with classic usage for use of most other Latin verbal stems.
- b. It might be ruled that all such words should be regarded as adjectives agreeing with the generic name in gender. This would be inconsistent with classic usage which recognizes both nouns and adjectives.
- c. It might be ruled that for each verbal stem classic usage should be determined and followed. This logically should be the point of view of those who insist that Latin precedent forbids the use of the adjectival endings -colus, -cola, -colum. This would mean that for guidance in nomenclature a tabulation of verbal stems would be necessary indicating for each whether nouns, adjectives, or both may be formed.

- d. Clement's recommendation might be approved, to the effect that in forming or using modern Latin specific epithets with verbal stems in the last component, the author is free to employ them as nouns or adjectives without regard to the specific Latin precedents for each verbal stem. This conforms reasonably well to current practice.
- e. It might be ruled that when a specific epithet is first used by an author in a binary combination with clear indication as to whether it is a noun or an adjective, the decision of the author shall be binding. For example, if an organism is first named Bacillus radicicola the word radicicola is fixed as a noun. If the status of the specific epithet is not fixed by first usage, whether it is an adjective or noun is to be determined by the first subsequent author who in transferring to another genus finds a decision necessary.

There is no firm agreement in biology as to the "part of speech" resulting from the use of Latin verbal stems in the coining of new compound specific epithets. Is it not possible that a common decision could be reached by agreement among bacteriologists, botanists, and zoologists?

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