CAPITALIZING THE APPROVED COMMON NAMES OF SPECIES

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INTRODUCTION

A single, sensible system of presenting approved common or vernacular names of species should eventually be established and supported by the scientific community (1). To capitalize the first letter of each word in a common name or not is only one component of this process, but it is probably the most prominent or noticeable part. It may also be one of the simplest concepts for approved common names on which scientists might agree.

The rules for forming and establishing Latin scientific names of species have been created by international scientific societies that are universally recognized by scientists (International Union of Biological Sciences, International Union of Microbiological Societies). These rules are set forth in the International Code of Zoological Nomenclature, the International Code of Botanical Nomenclature, the International Code of Nomenclature for Cultivated Plants, and the International Code of Nomenclature of Bacteria and an effort to enact a single, unified BioCode is also in progress (2,3).

The International Code of Virus Classification and Nomenclature is an exception. The viral authorities have abandoned Latin scientific binomials in favor of descriptive names in English, essentially common names (4), although they would probably be loathed to call them "common names."

The environmentalists, molecular biologists, and geneticists have developed their own “PhyloCode … The development of the PhyloCode grew out of a recognition that the current Linnaean system of nomenclature, as embodied in the preexisting botanical, zoological, and bacteriological codes, is not well suited to govern the naming of clades and species. These are the entities that compose the tree of life, and for this reason they are among the most theoretically significant entities above the organism level. In order to promote clear communication and efficient storage and retrieval of biological information, clades and species

require names that explicitly and unambiguously refer to those entities and do not change with time. The preexisting codes fail to provide such names for either kind of entity." (5,6). Some of these authorities find the Latin binomial system of scientific names too cumbersome and limiting to their fields of study and suggest the Linnean System be completely abandoned in favor of computer codings [e.g., the species *Homo sapiens*, Modern Human, becomes one word "homo-sapiens," a dot.com name "homo.sapiens," or a code "sapiens7523" (7). Such "radical lobotomization" of scientific names makes the suggestion of merely capitalizing com-mon names seem meek and mild in comparison.

The aforementioned codes for Latin binomials, however, do not consider common names. In fact, there is little agreement concerning common names of species (Table 1). A few specific societies have formed recommendations or rules for forming approved common names of smaller and more popular groups of organisms (8-21), but these minority suggestions are often ignored by the scientific community and almost universally in the popular literature. We are aware of no multi-disciplinary or unifying rules for the formation of approved common names (1).

Common names may seem to be the domain of the lay person and of little interest to the scientist. However, disagreements and inconsistencies among scientists have sometimes confused some scientific names for years, and such failings sometimes make common names important in discussing species. Often, in old literature, the only way to identify most misused or misquoted scientific names is through the recognition of their common names. For example, in the older fish parasitology literature, little attention was paid to the fish host and the only way to recognize the host species being discussed is by the common name that is used.

If scientists ignore their responsibility regarding approved common names, unanticipated difficulties may occur in the void, such as the formation of inappropriate or confusing common names by non-scientific authors attempting to popularize certain species. A vast array of gray or non-scientific literature exists based solely on common names. Much of this material is routinely lost, but what remains will be impossible to utilize without recognizable common names. More recently, the process of creating common names has been commercialized through the absurd notion of selling (i.e., starting at US$49.95) immortality by buying common names for species (22).

Organisms of economic importance, which usually receive the greatest input of scientific effort, are almost always known by their approved common names. Some commercial species have no valid scientific names because they are hybrids. For example, tilapia have been hybridized to produce many variants and color patterns (e.g., red tilapia) to appeal to public consumption. No scientific name can be applied to these variants and even their parent species are kept in complete secrecy by the industry. Even some common species still have no valid scientific name and are known only from their common name (e.g., taxonomists cannot properly apply a Latin name to brine shrimp).

Finally, common names are vital in communicating science to the layperson and general public. Most people only recognize and use common names of species.

As the first step towards standardizing the approved common names of species, we propose that the first letter of all approved common names of species be capitalized. We further suggest standard procedures for applying this suggested rule.

PROCEDURES FOR CAPITALIZING APPROVED COMMON NAMES OF SPECIES

The following was enlarged from the "Basic rules for bird names" (23).

Common Name Authorities

Approved common names can be designated by: (1) the original author(s) describing a new species, (2) expert(s) publishing monographs or checklists of groups of species, or best by (3) international scientific organizations publishing checklists and rules for forming common names.

Capitalize the First Letter

The first letter of each separate word in an approved common name is capitalized. Hereafter called "capitalizing common names."

Hyphenated Words

The first letter following a hyphen in a word in a common name is not capitalized (i.e., High-hat), unless that portion of the word is a proper noun (e.g., West-Atlantic Triton), a group name in which the species is a member (e.g., Thorny-Oyster) but not a group name in which the species does not actually belong (e.g., Black Cuckoo-shrike) (16), or a word of sufficient importance to be capitalized by the recognized authority for the group of species (e.g., Portuguese Man-of-War). In general, hyphenated words that precede or modify another word usually do not have the first letter following the hyphen capitalized (e.g., Horse-eye Jack), while modified or terminal hyphenated words often have these capitalized (e.g., African Hawk-Eagle).

Joined Words

Words even obviously formed from two separately existing words do not have the first letter of the second word capitalized (e.g., Seaperch). However, such joined or double words can be hyphenated to allow capitalization for clarification (e.g., "Pale Eelpout" to "Pale Eel-Pout" to match "Ocean Pout"), if changed by a recognized authority for the group of species.

Other Species Common Names

Only approved common names are designated with capitalization. Additional former, colloquial, regional, or local common names should not be capitalized. If capitalization gives the approved common name added status, then capitalizing additional common names would only undermine this distinction. These additional common names are probably best placed in quotes (e.g., Cobia or "lemonfish") and are best not used in the text of publications in place of approved common names.

Designated Common Names

In the absence of a known common-name authority, and the absence of a common name designated by the author describing a new species (an enlightened practice followed in Japanese journals), an author may designate a suggested common name. It can be capitalized, but should be placed in quotes (e.g., "Williams' Walrus"). Any discussion of changing an approved common name should also use this designation for the suggested replacement name (e.g., Sharksucker vs. "Inshore Remora") (24).

Group Common Names

The common names of groups are not capitalized (e.g., snails, groupers, whales). Similarly if only a part of the common name is used to refer to a species, then it is not capitalized (i.e., "Nassau Grouper will hereafter be referred to as 'grouper' in the text"). If a series of species uses the last word(s) of an approved common name only once at the end (e.g., Devil, Mimic, and Rusty crayfish), then the last word(s) of the name becomes a group name and is thus not capitalized. The first parts of the names still represent individual species and remain capitalized. Possibly redundance would be preferable in this case (e.g., Devil Crayfish, Mimic Crayfish, and Rusty Crayfish) both for common name stability and ease of retrieval.

Multiple Species

Symbiotic organisms (e.g., lichens, zooxanthellate coral-reef organisms) and hybrids (e.g., Mule, not Ass X Domestic Horse) may have approved common names different from the approved common names of their separate species. Species aggregates and species complexes may have temporary capitalized common names for clarity prior to the separation of actual species.

Fractional Species

Genetically engineered species may have capitalized common names, if they represent unique species. Subdivisions of species including subspecies (e.g., Wami tilapia), varieties (e.g., koi), variants (e.g., golden olive), and races may have approved common names distinct from their parent species approved common names, if these are designated by a scientific organization, but these subdivision names should not be capitalized. Cultivars ["cultivar" is shorthand for "cultivated variety," and abbreviated “cv.” (not in italics)] are capitalized like common names, but are distinguished by being placed in single quote marks (25,26). They are essentially common names. Pathovars (different strains of disease organisms) are designated by a Latin epithet. This is distinguished from the specific epithet or the subspecific epithet by the preceding abbreviation "pv." (not in italics)(27). Pathovars may have approved common names distinct from their parent species approved common names, if these are designated by a scientific organization, but these subdivision names should not be capitalized.

Life-Cycle Stages

Distinctive developmental stages often have different common names from the adult of the same species. These additional names are not capitalized unless they are recognized as either

the approved common name or an alternate approved common name (e.g., juvenile Black Snapper are called "sky snapper"). However, when the adult species is unknown, the life cycle stage may keep a capitalized common name. When the adult lacks a common name, a better-known life-cycle stage may retain the common name (e.g., Yellow Grub).

Disputed Common Names

When different common names are proposed by different scientific organizations (e.g., spotted seatrout [American Fisheries Society (14)] vs. Spotted weakfish [FAO (28)], or when more than one common name is listed due to difficultly in choosing a single common name (e.g., Green Heron or Green-backed Heron), then all of these names are approved common names by authorities and each can be capitalized. The most desirable outcome would be some agreement between authorities to choose a single approved common name for each species. However, due to continuing disagreements, the citing of common name authorities in publications may be necessary.

Some scientific organizations, particularly those working with obscure or unpopular organisms for which few common names have ever been employed, flatly state that all common names are discouraged. This is simply another form of ignoring the inevitable. Common names cannot be so easily banished by edict, they make dangerous and unpredictable orphans.

Fossil Common Names

Fossil species scientific names are often formed in systems that are incompatible with those for extant species. Relatively few fossil species have approved common names, but when they do, these should be capitalized the same as extant species. When the same species exists as both a fossil and extant form, only one common name should apply.

Understood Names

When a name is only understood in a common name, it is often added in parenthesis for clarification [e.g., Schoolmaster (Snapper), Hawksbill (Turtle)]. If these names are added in a publication, then they should be capital-ized.

International Common Names

Capitalization of common names should apply to names in all languages and translations. In fact, all common names should consider ease and clarity in translation as part of the name-forming process (common names in Japanese publications are often stated in both Japanese and English). Too many approved common names are so parochial that they are useless internationally. Approved common names should be internationally distinctive and accepted (29). Only those scientific organizations forming species common names for plant diseases (29), agricultural plants (19), seafood (30), birds (16), mammals (21), and aquaculture animals (31) have addressed this problem. The International Committee on Taxonomy of Viruses (32) has gone beyond mere international concerns to the "Universal System of Virus Taxonomy" (A title

the Search for ExtraTerrestrial Intelligence researchers might find a bit arrogant). The Zoological Record (33) lists checklists of animal species common names in different languages.

Diseases

The common names used for many microbial and parasitic organisms is simply the name of the disease or condition which each causes (e.g., Elephantiasis for *Wuchereria bancrofti*, River Blindness for *Onchocerca volvulus*) (8,34). A number of scientific organizations form official names for diseases or conditions. When the approved common name for a disease is the only common name used for the species causing the disease, then this name can be capitalized as the approved common name. We feel that all approved common names of diseases and conditions should also be capitalized (35). This has already been established in practice by the Center for Disease Control (36). When a species has been assigned an approved common name distinct from the approved name of the disease it causes, then the disease name should not be used in place of the species name.

Practical Use

Many scientific and applied-scientific organizations have established different approved common names for the same species. Commercial agricultural product approved common names may differ from approved common names established for the species (e.g., Greenland Halibut vs. Greenland Turbot); wildlife and game approved common names may differ (e.g., Peacock Bass vs. Peacock Cichlid); agriculture approved common names may differ (e.g., Chicken vs. Red Jungle Fowl, Redfish vs. Red Drum); ornamental plant and animal approved common names may differ (e.g., Grass Carp vs. White Amur).

A consensus name should be sought among contradictory systems. However, if this is not possible, then the basic science organization name should have priority over the applied science organization name. All of these alternative common names should be treated as "Other Species Common Names" as noted above. Eventually many of these alternative common names will become so popular that they will replace existing species approved common names. Part of the frustration that scientists incur when dealing with common names is the continuing popular evolution of names.

ADVANTAGES

Distinction

Approved common names have been created with much difficulty and effort. We should have some means of distinguishing them as engineered, evolved, and important products. Capitalization could grant common names distinction and recognition. Capitals can be used to officially designate these words as approved common names.

Separates Modifiers from Names

Modifiers of common names (e.g., speckled Escargot) can easily be separated from modifiers that are parts of capitalized common names (e.g., White Burrowing Anemone, Brown Woodland Warbler). Otherwise these can be quite confusing.

Distinguishes from Family or Group Names

Often approved common names are unfortunately mixed indiscriminately with family or group names. For example: Fuller et al. (37, page 18): "...trout, whitefish, smelt, pike, white sucker, black buffalo, brown bullhead, carp, rock bass, walleye, paddlefish, sturgeons, and gars..." does not distinguish approved common names of species from group or family names, but simple capitalization of common names would distinguish them: (i.e., trout, whitefish, smelt, pike, White Sucker, Black Buffalo, Brown Bullhead, carp, Rock Bass, Walleye, Paddlefish, sturgeons, and gars [gars and sturgeons are family common names; carp and whitefish are either common names of species groups or unapproved common names of species; pike, smelt and trout are either group or unapproved species common names or incorrectly formed family names]).

Many approved common names are the same as their family common name except that family names are plural [angel shark(s), bonefish(es), bowfin(s), dolphin(s), manta ray(s), mooneye(s), paddlefish(es), tarpon(s), for a total of 52 examples in Robins et al. (14)]. Capitalizing approved common names would further distinguish these family and common names. Common names of viruses are often confused among family, subfamily, genus, and species common names (ICTV, undated).

Standardization of Form

Establishing one system would eliminate or at least simplify existing confusion in the use of common names. At present, common names appear variously with no capitals, with the first letter of the first word capitalized, with the first letter of each word capitalized, in all capitals, with first letters in large capitals and others capital, or with first letters in capitals and others in small capitals (Table 1). Unfortunately, common names often appear in different forms even in the same article or book.

Most scientific authorities for common names of species either suggest capitalization or all lower-case letters (Table 1). This creates incongruities in current usage. Plant common names are usually not capitalized (12,19, Table 1) while plant disease common names are capitalized (8). Further, bacterial plant diseases are capitalized by one authority (8) yet not capitalized by another (29). The revision of Anonymous (8) changes from capitalizing the names of plant pathogens to only capitalizing their first words (38), yet continues to capitalize the common names of the plant hosts. Some authorities on common names state that only proper nouns are capitalized, yet capitalize the first word of each common name in their checklists (e.g., 39). Some fish authorities suggest lower case names, while others suggest capitals (Table 1).

Contrast

Scientific names are set off from text by the use of italics. Common names should also be set off by capitalization if only for the ease of locating them in text. Without the distinction of capitalization, authors are often forced to use a wide variety of drastic means to separate

common names in text (e.g., double parenthesis, bold-face type, small capitals). Recently the ichthyology-herpetology journal Copeia began capitalizing the approved common name of a species, the first time it appeared in an article, to distinguish it (40).

Equivalency Among Groups

Most scientific journals have their own policy for treating common names. They have no choice because if they followed the recognized authorities for common names, then a common name for a bird (9) would appear in a different form than one for a fish (14) (Table 1). Journal and book editors deliberately choose to be incorrect (according to one or more common name authorities) to be consistent. Different format systems cause confusion. A species common name should be in the same form for a ciliate and a whale.

Provide Continuity and Conformity

Common names represent an important interface with the public. Highly contradictory and confusing systems do not inspire public confidence.

Much confusion exists in the use of common names in scientific journals (41): "Popular names of featured species will normally be printed as proper names with capitals, as will the name of phyla, families, and other taxa. However, a common-sense policy will be applied to species that are not the main topic of the article, and will be printed with a small letter, e.g. barnacles, crabs, cod, crustaceans etc." The scientific journal Copeia once required the capitalization of the approved common name of a species when it first appeared in an article (40), but in each subsequent usage the common name was not capitalized. This seems the height of standardized inconsistency.

DISADVANTAGES

Concealing Proper Nouns

The only major disadvantage that we can discern is that if all first letters of common names are capitalized, then proper names of people or places may not be recognized. However, most place names are obvious (e.g., Puerto Rican Tanager), and people names are in the form of possessives (e.g., Randall's Rough, Williams' Wren).

Confusion with Authors

Parts of capitalized common names could be confused as the author of a scientific name (e.g., *Pollachius virens* Pollock – a fish named by Dr. Pollock?), but this will not occur so long as scientific names and common names are properly separated by a comma (e.g., *Pollachius virens*, Pollock). The same confusion can happen without capitalizing common names (e.g., *Syncerus caffer* Cape buffalo – a buffalo named by Dr. Cape?), when commas are not used.

Confusion with Cultivar-Group Epithets

Cultivars were previously discussed as species subunits. Similar cultivars may be combined into groups which are then called "cultivar-groups." The epithets representing cultivar-groups are essentially single-word to phrase capitalized common names followed by the word "Group." Formal usage places these group names in parenthesis in combination with cultivar names; however, they sometimes appear in more casual form (e.g., *Allium cepa* Shallot Group, *Hydrangea* Hortensia Group). Many of these epithets use the same words as found in common names (e.g., "Shallot" is a common name in English and "Hortensia" is a common name in Spanish), thus some confusion could occur. However, any confusion can be eliminated by the simple mechanism of separating scientific names from common names by a comma since cultivar groups are not so separated.

Confusion in Forming Names

Any change adds complexity and the possibility of errors and confusion. However, capitalizing common names appears to be relatively straight forward.

Opposing Honored Systems

A less important problem is attempting to change traditional rules and regulations of well-established organizations that use different systems. If we believe that having one, standard system is desirable, then invariably, many of the existing systems must be discarded or modified. This is a regrettable, but unavoidable cost of progress. Besides capitalizing, or not, is a rather trivial change in these systems (42 – actually an inversion of this paper's uninten-tionally circular argument).

Cracks are forming in the resolve of some of these time-honored organizations, and in the least expected places. The American Fisheries Society (AFS) in agreement with the American Society of Ichthyologists and Herpetologists (ASIH) are the main proponents of not capitalizing common names of species (43). Recently the Chairman of the Common and Scientific Names of Fishes Committee of AFS, that produces the "bible" of not capitalizing (14), came out in favor of capitalizing the common names of fishes (44). Copeia, the journal of ASIH, recently required the capitalization of a common name of a species the first time that it appeared in a scientific paper to distinguish the common name (40). Another venerable organization, which formed approved common names without capitalization, the Society for the Study of Amphibians and Reptiles, recently switched to capitalization (45). These developments suggest some hope for a consensus on capitalizing common names may exist.

Emotion

The question of capitalization seems to generate a great deal of emotion (44), if not animosity, among many scientists. Many of those taxonomists who we originally asked to review this manuscript had such strong emotional reactions, devoid of any logic, that we were unable to use their efforts. Kendall (42) appears to counter the suggestion of Nelson et al. (44), to capitalize the common names of fishes, with a largely emotional response devoid of any reasons to not capitalize (i.e., "…unwilling to enter an unrewarding debate over veiled value systems." [translation = I cannot think of any plausible reason not to capitalize]). However,

proponents of capitalization prove no more gracious. Schueler (43) states "the main proponent of lower casing names is the American Fisheries Society, with exploitation embedded in its name,". We would hope for some degree of civility in this argument. We do not wish to incite a flame war online.

CONCLUSIONS

If PhyloCode succeeds in replacing scientific Latin binomal names with some sort of unique, but dissociated, codes, then common names may be all that remain for the vast majority of us to recognize and work with the phylounits once called species. A Domestic Dog will still be a dog whether it is called "*Canine domesticus*" or "2736954-1". However, try using 2736954-1 in conversation. Common names could evolve from a convenience to a necessity. Thus properly designating and distinguishing approved common names may become even more important.

If we assume that PhyloCode proceeds on a less drastic, and more likely course, by becoming independent from the Latin binomial system without replacing it, then the only links connecting units in these two systems may be common names. The further the distinct systems diverge and disperse, the more important the bridges of common names become. Conceivably, approved common names may become the basis of taxonomic stability between incompatible, if not mutually exclusive, scientific nomenclatural systems.

The major advantages of capitalizing common names of species include (1) distinguishing approved common names, (2) separating modifiers from names, (3) standardizing form, and (4) contrasting names from text. No major disadvantages exist. Thus the value of capitalized common names is clear. We ask the scientific and lay communities to embrace this suggestion. We hope this procedure will not only be useful, but will help to promote the standardization of common names for species.

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Table 1. Capitalization of Common Names by Scientific Organizations [A Sampling of Organizations as an Example of Variation, not an Exhaustive Survey].

Scientific Organization	+ Capitalized first letter of each word * First letter, First word - Not Capitalized	Reference(s)
Amer. Fish. Soc.	*	39
Amer. Fish. Soc.	-	14,15
Amer. Ornitholog. Union	+	9
Amer. Phytopatholog. Soc.	+	8
Amer. Soc. Ich. Herpetol.	-	14,15
Amer. Soc. Mammalog.	+	21
Assoc. Tropical Lepidoptera	+	46
British Mar. Life Assoc.	+	Internet (see below)
CephBase	*	47
CITES	+	Internet (see below)
CMS	+/*	Internet (see below)
DesertUSA	+	Internet (see below)
Common Names Plant Dis.	+	8
	*/+	38
Entomolog. Soc. Amer.	+?	18
	-	48
FDA Seafood List	+	Internet (see below)
FishBase (ICLARM)	*	49
GRIN	-	19
Herp. League	+	44
Index of Turtles	+	Internet (see below)
Inst. Food Agricult. Sci.	+	Internet (see below)
Intern. Whaling Comm.	-	Internet (see below)
Nat. Plants Database	-	Internet (see below)
Nevada Sensitive Species	+	Internet (see below)
N. C. Biological Survey	*	50,51
Odonata of North America	+	52,53
Pherolist	-	Internet (see below)
Reg. Fish Encyclop.	+	Internet (see below)
Royal Ontario Museum	+	Internet (see below)
Soc. Std. Amphib. Rept.	-	11
Soc. Std. Amphib. Rept.	+	45
Species 2000	+	Internet (see below)
Universal Virus Database	*/-	54
U.S. FDA	+/*/-	Internet (see below)

W. Aust. Mus.	+	55
The Wildlife Society	-	56 etc. (see below)

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*Some of these organizations state in their rules for forming common names that only proper nouns are capitalized, but in their checklists they capitalize the first letter of the first word in all common names.

Amer. Fish. Soc. = American Fisheries Society; **Amer. Malacolog. Soc**. = American Malacological Society; **Amer. Ornitholog. Union** = American Ornithological Union; **Amer. Soc. Ich. Herpetol.** = American Society of Ichthyolo-gists and Herpetologists, Joint ASIH-American Fisheries Society Committee on Names of Fishes; **Amer. Soc. Mam-malog.** = American Society of Mammalogists, Mammal Species of the World www.nmnh.si.edu/msw/; **British Mar. Life Assoc**. = British Marine Life Association, ourworld.compuserve.com/hompage/BMLSS/; **CephBase** = National Resource Center for Cephalopods; **CITES** = Convention on International Trade in Endangered Species of Wild Fauna and Flora environment.Harvard.edu/guides/intenvpol/indixes/treaties/CITES.html; **CMS** = Convention on Migratory Species, www.wcmc.org.uk/cms/cms_ckls.htm; **Common Names Plant Dis**. = Common names for plant diseases, American Phytopathological Society Committee on Standardization of Common Names for Plant Diseases 1978-1996, second line = same 1978-2001; **DesertUSA** = DesertUSA Wildflowers Field Guide www.desertusa.com/wildflo/-FieldGuide/fieldguide.html; **Entomolog. Soc. Amer**. = Entomological Society of America; **FDA Seafood List** = U. S. Food and Drug Administration Seafood List of FDA Approved Market Names, Center for Food Safety and Applied nutrition, vm.cfsan.fda.gov/~frf/seaintro.html/; **GRIN** = Germplasm Resources Information Network of the National Plant Germplasm System of the U.S. Agricultural Research Service U.S. Department of Agriculture, www.ars-grin.gov/npgs/tax; **Herp. League** = Herpetological League; **Index of Turtles** = theturtlepages.crosswinds.net/species/; **Inst. Food Agricult. Sci**. = Institute of Food and Agricultural Sciences, University of Florida ifas.ufl.edu; **W. Aust. Mus.** = Western Australian Museum book on anemones and anemone fishes www.biodiversity.uno.edu/ebooks/; **Intern. Whaling Comm**. = International Whaling Commission, iwcoffice.-org/iwc.htm; **Nat. Plants Database** = National Plants Database of the U.S. Department of Agriculture National Research Conservation Service, plants.usda.-gov/home_page.html; **Nevada Sensitive Species** = Latin and Common Names of Sensitive Species in Nevada, www.upr.unr.edu/sensitive_species.html; **N. C. Biological Survey** = North Carolina Biological Survey, publication #1980-12, North Carolina State Museum; **Pherolist** = The Pherolist, database of the Working Group on pheromones and other semiochemicals of the International Organization of Biological Control, www.nysaes.cornell.edu/pheronet/; **Reg. Fish Encyclop.** = Regulatory Fish Encyclopedia of the U.S. Food and Drug Administration, Seafood Products Research Center, Center for Food Safety and Applied nutrition, vm.cfsan.fda.gov/~frf/rfeO.html/; **Royal Ontario Museum** = Royal Ontario Museum, Complete Common Name Directory, Flora of Muskoka, www.library.-utoronto.ca/muskoka_flora/common.htm; **Soc. Std. Amphib. Rept**. = Society for the Study of Amphibians and Reptiles; **Species 2000** = www.usa.sp2000.org/; **Universal Virus Database** or the International Committee on Taxonomy of Viruses Data Base, Reports of the International Committee on Taxonomy of Viruses, www.ncbi.-ulm.nih.gov/ICTVdb/at-ictvd.htm/; **U.S. FDA**

= U.S. Food and Drug Administration, www.fda.gov/; **The Wildlife Society**, Washington, DC, Scott and Wasser (56), Little (57), McGregor et al. (58).