

Linnean "Elements" in the Indiana Fauna and Flora

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Abstract

Previous studies have investigated the nature and origins of insect names, particularly folk names of dragonflies and the "insect" generic names of Linnaeus (17, 18, 19).

The Linnean elements (names of genera and taxa of the species-group) of the Indiana Biota were analyzed to determine the numbers and percentages of each group named by Linnaeus. This varies for genera from 62% in plants to 2.0% in dragonflies, and for species from 45.8% in birds (35.0% in plants) to 2.0% in both beetles and dragonflies.

These names of Indiana taxa were used as a basis for a comparison of the differences in the treatment of the names of plants and animals by Linnaeus, and to show the sources of his plant names. Most of these were adopted or adapted from earlier authors, many of them (although, perhaps, not as great a proportion—91%—as his insect names) being classical Latin or Greek words almost identical with those used by Pliny, Theophrastus and Dioscorides. Linnaeus usually gave credit to earlier authors (although, not necessarily to the first, even of late medieval or early modern authors to use them), most frequently to Tournefort, but gave no credit or reference to earlier authors for generic names of animals.

A discussion of insect names, their nature and origins was published previously (18, 19).

The study of Linnean insect names led to an interest in the differences in the origin and treatment of the names which Linnaeus used for plants and animals. For a study of such differences the Linnean taxa listed in two comprehensive state catalogues of roughly comparable size—Deam's Flora (3) and Blatchley's Coleoptera, or Beetles (1) of Indiana were used. However, the study was quickly expanded to other groups for which there are good Indiana lists, dragonflies (16), fishes (4), amphibians and reptiles (15), birds (20) and mammals (14) and to some consideration of all generic names used by Linnaeus in his *Systema Naturae* (11).

A tabulation of the numbers and percentages of the Indiana taxa attributed to Linnaeus is given in Table 1. The proportions of Linnean taxa in plants, vertebrates and insects in that order (except for species of birds) may, indeed, reflect his relative inherent knowledge of these groups. It is also affected, perhaps much more, by the state of knowledge of the different groups at the time, since Linnaeus was primarily an encyclopedist, compiling available information rather than doing original work himself. This knowledge was dependent upon the relative interest and activity of writers and collectors of the several groups. Since there was no biological exploration of Indiana until after the time of Linnaeus, the ranges of the diverse groups were the chief factors determining what would be available to collectors. Linnaeus generated a great interest and collecting activity through his correspondence and by the dispatch of his students to every possible area. No doubt his stimulation of plant exploration was greater than that of animal collection.

TABLE 1. Numbers of genera and species (including subspecies and varieties) of selected groups of the Indiana Biota, showing the numbers and percentages named by Linnaeus.

Group	Listed for Indiana					
	Genera			Species, etc.		
	Total	Linnean		Total	Linnean	
		No.	%		No.	%
Plants -----	737	458	62.0	2593	907	35.0
Beetles -----	858	24	2.7	3312	67	2.0
Dragonflies -----	51	1	2.0	148	3	2.0
Fishes -----	94	8	8.5	180	9	5.0
Amphibians -----	15	2	13.5	42	1	2.4
Reptiles -----	34	2	5.9	62	11	17.7
Birds -----	217	28	12.9	358	164	45.8
Mammals -----	67	13	19.4	101	12	11.9

Some people believe that Linnaeus was the first to name plants and animals, at least in any exhaustive manner. A much greater number have the idea that he: 1) invented binomial, *i.e.*, binary or two-word, names (genus and species); 2) was the first to completely classify plants and animals; 3) started the practice of creating names for all groups by compounding words from Latin and Greek roots and affixes; and 4) created an hierarchy of classification (kingdom, class, order, genus, species) and formulated names for all of these groups. None of these are true; yet, his reputation is such that it is sometimes impossible to trace the actual application of ancient names because lexicographers quote him as an authority. It is also difficult or impossible to trace the development of plant and animal names in reference books, even biological dictionaries and encyclopedias, because they start with his classification and nomenclature and discuss the development as if his treatment were the beginning.

Stearn (21) pointed out that binomial names for plants may be found in ancient Greek, Latin, German and English long before they were used by Linnaeus. Furthermore, Kaspar Bauhin, in 1623, published a review of all known plants, about 6,000 species, using a system of classification based upon genus and species, essentially the binomial system. This has been traced back to the ancients, as it is an attribute of the human mind to group like things, then distinguish them from each other. This can frequently be done with only two words.

In his "Historia Generalis Plantarum" in three volumes, from 1686 to 1704, John Ray of England delineated 18,600 plants, giving information on structure, physiology, distribution and habits. The main divisions of classification recognized today were laid out on the basis of a natural system. He did almost as much for animals.

The insect generic names of Linnaeus were largely (91%) Latin and Greek words adopted almost without change, and some of the compounding from roots and affixes can be traced back as far as Sophocles in the 5th Century B.C. (19). Linnaeus named seven orders of insects,

Aptera, Diptera, Coleoptera, Hemiptera, Lepidoptera, Neuroptera and Hymenoptera. These names are elegant expressions of the wing characters and it would seem that he did a fine job in formulating them. However, three, Aptera, Diptera and Coleoptera, were used by Aristotle and Hymenoptera appears in the writing of Strabo (10).

His contemporaries charged Linnaeus with two particular faults (2). Haller, the Swiss naturalist, accused him of trying to be a second Adam and name all plants and animals; and Dillenius, Professor of Botany at Oxford, objected to his system of classification and his use of the Greek names of Theophrastus and Dioscorides. Dillenius noted that the day might come when the plants to which the ancients applied these names would be identified and if the names were used for other plants the confusion would be great.

A later botanist, J. van Sachs, observed that Linnaeus "was content to know all his species exactly by name and never made a single important discovery throwing light on the nature of the vegetable or animal kingdom" (21). Linnaeus, himself, in an autobiographical sketch begun in early life and frequently updated, written in the third person, declared (2): "No one before him had pursued his profession with greater zeal and had more hearers; made more observations in natural history; had fuller insight into the three kingdoms of nature; been a greater botanist or zoologist; so well described the natural history of his own country—its flora, fauna and topography; written more books, more correctly, more methodically, from his own experience; so completely reformed a whole science and inaugurated a new era; sent out his disciples to so many parts of the world; written his name on more plants and insects, indeed on the whole of Nature; become more famous the whole world over; listed so many animals—yes, as many as all the others put together; been a member of more scientific societies." In view of these divergent criticisms and assessments of Linnaeus, one may well ask the true character and value of his contribution to biology. In one sense or another each of the appraisals, including those by himself, is true. While he did not contribute any new discoveries, or even invent any nomenclatural schemes, his compilation and organization of all known species of plants and animals, neatly arranged in a system of categories, instituted a major epoch in the history of biology. The introduction of a uniform scheme of names for known biological units enabled the proper integration of the vast numbers of new plants and animals which were discovered during the century following his work. This era of systematic growth dominated biology until the appearance of Darwin's theory of evolution. The systematic arrangement of living things probably made the discovery of evolution inevitable, although nothing could have been further from the idea and beliefs of Linnaeus.

His first knowledge of the names of plants and their classification came from the works of Tournefort. Probably for this reason he was inclined to use Tournefort's names, attributing to him many which had been in use for a long time, some since antiquity (Tables 2-4).

TABLE 2. *Linnean genera of the Pteridophyta regional to Indiana*¹.

Genus name; technical common	Source of Name as cited by			Origin or derivation of name; gender and meaning or application if a classical word, and citations of ancient authors using it in this sense
	Linn.	Gray	Deam	
<i>Adiantum</i> Maidenhair fern	T	L	T	*(L). <i>adiantum</i> , N. Pliny.
<i>Asplenium</i> Spleenwort	(L)	L	--	*(L). <i>asplenium</i> , N. Pliny. *(Gr). <i>asplenon</i> , N. Dsc.
<i>Equisetum</i> Horsetail	T	L	T	*(L). <i>equisaetum</i> (<i>equus sita</i>), N. Pliny.
<i>Isoetes</i> Quillwort	(L)	L	L	(L). <i>isoetes</i> , N. the small house leek. Pliny. (Gr). <i>isoetes</i> , N. houseleek. Dsc., Thphr.
<i>Lycopodium</i> Clubmoss	(L)	L	L	NL, ex (Gr), <i>lukos</i> , a wolf + <i>pous</i> , foot.
<i>Marsilea</i> Pepperwort	(L)	L	--	A patronymic; named for Aloysius Marsili, Italian naturalist.
<i>Onoclea</i> Sensitive fern	(L)	L	L	ex (Gr), <i>onokleia</i> , F. alkanet, a dye-producing plant. Dsc., Thphr.
<i>Ophioglossum</i> Adder's tongue	T	L	T	NL, ex (Gr), <i>hophis</i> , a serpent + <i>glōssa</i> , tongue.
<i>Osmunda</i> Royal fern	T	L	T	Med.L., ex Saxon, <i>Osmunder</i> , name for the Celtic god Thor.
<i>Polypodium</i>	T	L	T	*(L). <i>polypodium</i> , N. Pliny. *(Gr). <i>polypodion</i> , N. Dsc., Thphr.
<i>Pteris</i>	(L)	L	--	*(Gr.), <i>ptēris</i> , F. Dsc., Thphr.

¹ See Appendix 1.

Linnaeus said that Latin and Greek names were the best and a great proportion of his names, especially those of animals, are just that. This was shown for insects (19) and the same appears to be true for other animals, especially mammals and birds, although no exact percentages have been calculated. As his knowledge of plants was much greater than that of animals, his need for names for plant genera was correspondingly greater. In addition to the adoption of the names of others, and the compounding of some from roots and affixes, he turned to patronymics. He named plant genera for his father-in-law, most of his former teachers, many of his students, famous botanists and many others. No patronymic has been detected among his names for animals.

Linnaeus had no idea of selecting a name on the basis of priority. He merely wanted what he considered the best name. If he found none that satisfied him he selected new ones; his selections were seldom, if ever, without reason. He rejected names with more than 12 letters, those ending in -oidea, obviously double names, etc. It has been those following him who made him the "second Adam" by decreeing through the Codes of Nomenclature that whatever name Linnaeus used would be the name of the plant or animal. Such features of nomenclature were not formulated for over 100 years; the exact dates for such "beginnings" came even later. As shown in the Tables (2-4), the Kew Index (8) cites papers of Linnaeus from 1735 to 1753 for the origin of his generic names. Gray's Manual (5) cites the older authors rather than Linnaeus for the names which he adopted from them. The citation of authors for

these names of Linnaeus has led to the dual system of credit in citing authors in botanical works—Linnaeus and the author from whom he took the name for Linnean genera, and the author of the species name plus the name of the authority who placed it in the genus to which it is assigned for species. This double citation is not followed in zoology. There seems to be much disagreement concerning the pre-Linnean authors to be cited—note the difference between those cited by Linnaeus (12, 13), the Kew Index (8), Gray (5) and Deam (3) as indicated in Tables 2-4. Linnaeus seems not to have gone backward any farther than Tournefort in crediting names, although as indicated in Table

TABLE 3. *Linnean genera of the Gymnospermae and of the Scrophulariaceae recorded for Indiana (Including some not native to the state).¹*

Genus names: technical common	Source of Name as cited by				Origin or derivation of name; gender and meaning or application if a classical word, and citation of ancient authors using it in this sense
	Linn.	Kew	Gray	Deam	
<i>Abies</i> Fir	T*	T	Link	--	*(L). <i>abies</i> , F. Pliny, Vergil.
<i>Juniperus</i> Juniper	T	T	L	T	*(L). <i>juniperus</i> , F. Pliny, Vergil.
<i>Larix</i> Larch	T*	T	T	T	*(L). <i>larix</i> , F. Pliny. *(Gr). <i>larix</i> , F. Dsc., Pliny.
<i>Pinus</i> Pine	T	T	T	T	*(L). <i>pinus</i> , F. Horace, Ovid, Pliny, Vergil. ex *(Gr). <i>pitys</i> , F. Dsc., H(O), Thphr.
<i>Taxus</i> Yew	T	T	T	T	*(L). <i>taxus</i> , F. Caesar, Ovid, Pliny, Vergil. (Gr). <i>taxon</i> , a bow, for which wood of this was used.
<i>Thuja</i> Arbor-vitae	T	T	--	T	(L). <i>thya</i> (or <i>thya</i>), F. a resinous tree. Pliny. (Gr). <i>thya</i> , F. (same as Latin). Thphr.
<i>Antirrhium</i> Snapdragon	T	T	T	--	*(L). <i>antirrhinon</i> (or <i>--um</i>), N. Pliny. *(Gr). <i>antirrhinon</i> , N. Dsc., Thphr.
<i>Buchera</i> Blue-hearts	(L)	L	L	--	A patronymic, honoring J. G. Buchner, an early German botanist.
<i>Chelone</i> Turtle head	D	L	T	T	(L). <i>chelonum</i> , N. a plant also called <i>cyclaminosa</i> . (Gr). <i>chelônē</i> , F. a tortoise. Hdt., Homer.
<i>Gerardia</i> .	P	L	L	L	A patronymic, dedicated to the famous herbalist, John Gerarde.
<i>Gratiola</i>	(L)	R	L	B	NL, ex (L), <i>gratia</i> , grace, or favor, because of supposed excellent medicinal properties.
<i>Linaria</i> Toad flax	T*	T	T	B	(L). <i>linaria</i> , F. a linen factory. Tiro (Cicero's ex (Gr). <i>linon</i> , N. flax. Homer. freedman)
<i>Melampyrum</i>	T	T	T	B	NL, ex (Gr), <i>melas</i> , black + <i>pyros</i> , wheat, from of seeds mixed in the harvested grain.
<i>Mimulus</i> Monkey-flower	L	L	L	--	?ex (L). <i>mimulus</i> , M. (dimitive of <i>minus</i> , an actor), a little actor or mime. (post-classical).
<i>Pedicularis</i> Lousewort	T	T	T	B	NL, ex (L). <i>pediculus</i> , M. a louse.
<i>Scrophularia</i> Figwort	T	T	T	B	NL, ex (L). <i>scrofulae</i> , F. a pathological swelling of glands of the throat.
<i>Verbascum</i> Mullein	T	T	L	B	*(L). <i>verbascum</i> , N. Pliny.
<i>Veronica</i> Speedwell	T	T	L	B	Derivation doubtful (?named for Verona, birth-place of Pliny).

¹ See Appendix 1.

3, Deam cited Bauhin for seven of the generic names in the Scrophulariaceae. An examination of the specific descriptions in the genera *Verbascum* and *Veronica* both of which he attributed to Tournefort, quoted by Linnaeus (12) reveals that he noted the use of both names by Bauhin. Of 27 species of *Veronica*, Bauhin was cited for 18, and 10 of the 18 were described under the name *Veronica*. Of nine species of *Verbascum*, Bauhin was cited for eight with *Verbascum* used for six. It would seem somewhat illogical to cite any of these authors for the origin of the names since most of them were used by ancient Latin and Greek writers—note especially the pteridophytes (Table 2) and the gymnosperms (Table 3). Further study of the information in the tables, particularly of the Scrophulariaceae (Table 3) and the grasses (Table 4), would indicate that Dillenius had a good basis for his charge that Linnaeus was using the names of the ancient authors incorrectly. Of course, the "modern" application of some of the names had been made by earlier authors, whom Linnaeus followed. Also the identity of many of the plants to which the names were applied in antiquity has been irretrievably lost and their use by Linnaeus is not likely to result in any confusion. In at least one case there could be objection to his use of a name, and it could scarcely be excused because of any lack of knowledge of its ancient application. As he wrote in Latin he usually employed Latin names if they were known; thus, his choice of *Ulmus* for the elms would be correct. Never-

TABLE 4. *Linnean genera of the Gramineae (Grass Family) recorded from Indiana, (including some which are found only as "escapes" from cultivation).*

Genus names: technical common	Source of Name as cited by				Origin or derivation of name; gender and meaning or application if a classical word, and citation of ancient authors using it in this sense
	Linn.	Kew	Gray	Deam	
<i>Aegilops</i> Goatgrass	(L)	L 1737	--	--	(L). <i>aegilops</i> , F. a tare in barley. Pliny. (Gr). <i>aegilōps</i> , M. (same as Latin). Dsc., Thphr.
<i>Agrostis</i> Bentgrass	(L)	L 1735	L	L	(L). <i>agrostis</i> , F. a grass. App.Herb. (Gr). <i>agrōstis</i> , F. dog's tooth grass. Dsc., H(O).
<i>Alopecurus</i> Foxtail	(L)	L 1735	L	L	(L). <i>alpecurus</i> , F. a kind of plant. Plin ⁷ . (Gr). <i>alopekoyros</i> , M. bear grass. Thphr.
<i>Andropogon</i> Beardgrass	(L)	L 1753	L	L	NL, ex (Gr), <i>anēr</i> , man + <i>pōgōn</i> , beard.
<i>Anthoxanthum</i> Sweet vernal grass	(L)	L 1737	L	L	NL, ex (Gr), <i>anthos</i> , flower + <i>xanthos</i> , yellow.
<i>Aristida</i> Three-awn grass	(L)	L 1753	L	L	(L). <i>arista</i> , F. awn or beard of grain. Cicero, Ovid.
<i>Avena</i> Oat	T	L 1735	L	L	* (L). <i>avena</i> , F. Horace, Vergil.
<i>Bromus</i> Bromegrass	M	D 1735	L	L	(L). <i>bromos</i> , M. oat. Pliny. (Gr). <i>bromos</i> , M. oat. Dsc., Hpp.
<i>Cenchrus</i> Burggrass	(L)	L 1737	L	L	(Gr). <i>kegchros</i> , M. millet. Hesiod, Hdt., Hpp., Thphr.
<i>Cinna</i> Woodreed	(L)	L 1753	L	L	(Gr). <i>kinna</i> , N. a kind of barley. Dsc.

¹ See Appendix 1.

TABLE 4. Continued

Genus names: technical common	Source of Name as cited by				Origin or derivation of name; gender and mean- ing or application if a classical word, and cita- tion of ancient authors using it in this sense
	Linn.	Kew Ind.	Gray	Deam	
<i>Cynosurus</i>	(L)	L 1737	L	L	NL, ex (Gr), <i>kynos</i> , dog + <i>oura</i> , tail.
<i>Dactylus</i> Orchard grass	(L)	L 1742	L	L	(L). <i>dactylus</i> , M. a kind of grass (also a grape). Pliny.
<i>Elymus</i> Wild rye	(L)	L	L	L	(Gr). <i>elymos</i> , F. millet. Dsc., Hpp.
<i>Festuca</i> Fesque grass	(L)	T 1735	L	L	(L). <i>festuca</i> , F. straw-like weeds which grow in barley. Pliny.
<i>Holcus</i> Meadow softgrass	(L)	L 1735	L	L	(L). <i>holcus</i> , M. a kind of grass (<i>Hordeum</i> sp?). Pliny.
<i>Hordeum</i> Barley	T	T 1735	T	T	*(L). <i>hordeum</i> , N. Cato, Columella, Livy, Pliny.
<i>Lolium</i> Ryegrass	(L)	L 1735	L	L	(L). <i>lolium</i> , N. cockle, or tares. Pliny.
<i>Melica</i> Melic-grass	(L)	L 1737	L	L	?ex (L). <i>melica</i> , F. probably a kind of vessel. (also this is the Italian name for sorghum, ex <i>mel</i> , honey).
<i>Milium</i> Millet grass	T	L 1735	T	L	(L). <i>milium</i> , N. ancient name of Millet. Pliny, Vergil.
<i>Panicum</i> Panic-grass	(L)	L 1735	L	L	(L). <i>panicum</i> , N. Italian millet. Caesar, Pliny. ?ex (Gr), <i>panikos</i> , adj. of or for Pan; panic; fears.
<i>Phalaris</i> Canary grass	(L)	L 1735	L	L	*(L). <i>phalaris</i> , F. Pliny.
<i>Paspalum</i>	(L)	L 1759	L	L	(Gr). <i>paspalos</i> , M. another name for <i>Kengchros</i> , millet.
<i>Phleum</i> Timothy	(L)	L 1735	L	L	(Gr). <i>phleōs</i> , M. a kind of reed. Aristotle, Thphr.
<i>Poa</i> Bluegrass	(L)	L 1737	L	L	*(Gr). <i>poa</i> , F. (possibly any grass, or fodder). Hesiod, H(O), Hdt., Thphr.
<i>Secale</i> Rye	(L)	T 1735	L	--	*?(L). <i>secale</i> , N. (a kind of grain; rye, or spelt?). Pliny. *?(Gr). <i>sēkalis</i> , N?. (possibly derived from Latin).
<i>Stipa</i> Needle grass	(L)	L 1753	L	L	(L). ex? <i>stipa</i> (correctly <i>stuppa</i>), F. the coarse part of flax. (Gr). <i>stuppē</i> , F., (or <i>stuppion</i> , N.). same mean- ing as in Latin. Hdt.
<i>Tripsacum</i> Gama-grass	(L)	L 1759	L	L	NL, ex (Gr), <i>tribō</i> , to rub. Perhaps in allusion to the polished fertile spike.
<i>Triticum</i> Wheat	T	L 1735	--	L	*(L). <i>triticum</i> , N. Caesar, Cicero, Columella, Pliny.
<i>Uniola</i> Spikegrass	(L)	L 1737	L	L	(L). <i>uniola</i> , F. an unidentified plant. App.Herb.
<i>Zea</i> Corn	(L)	L 1737	--	L	(L). <i>zea</i> , F. a kind of grain (spelt?). Pliny. (Gr). <i>zeia</i> , F. varieties of wheat. Dsc., H(O), Thphr.
<i>Zizania</i> Wild rice, etc.	G	G 1742	G	L	(L). <i>zizania</i> , N. cockle or tares. Ambrose; the Vulgate. (Gr). <i>zizanon</i> , N. some wild grass, or tares. New Testament.

¹ See Appendix 1.

theless, there seems to be little justification for applying the Greek name *Ptelea*, used as a name of the elm by almost every Greek writer from Homer to Dioscorides, to an entirely different genus, even in a different family!

Linnaeus wrote in Latin because that was the universal language of the universities of his time. His use of it, however, was far from classical, and he virtually created a new language, taxonomic Latin—descriptions in a telegraphic style, almost entirely without verbs, employing only a few nouns and depending chiefly on adjectives. He did retain one feature, gender, which has little intrinsic value to nomenclature, and which is one of the most troublesome problems in nomenclature to the average American biology student today. As gender is an essential property of both Latin and his native Swedish, the thought that it might not be necessary could never occur to Linnaeus.

A comparison of the numbers of genera and species (Table 5) listed in the 1st and the 10th editions of the *Systema Naturae* (11) shows that Linnaeus increased his knowledge greatly between 1735 and 1758/59. Although he was interested primarily in botany he listed only genera of plants in 1735. However, he had a most elegant chart, showing classes, orders, genera and species of animals. A close examination reveals that his actual classification of animals was considerably less impressive than the treatment would indicate. Species names were quite variable in form—one word which was sometimes the same as the genus name, or two words one of which was frequently, but not always the same as the genus name. The development of a true binary nomenclature in his publications came much later, reaching completeness only in 1753 for plants (12) and 1758 for animals (11). Although folk names tend to be single words, or binomials to distinguish related species as pointed out above, rarely trinomials, names had become much longer as the knowledge of plants and animals grew. The naming followed the rule of Aristotle for defining or distinguishing anything—place it in its lowest possible group (genus) and differentiate it from other members of that group (differentia, or specific name). This practice of naming a species—genus plus differentia—had been more or less the practice since antiquity. With the increase in the number of species known the “species names” necessarily became longer. These were the “species names” referred to by Linnaeus when he first formulated his rules of classification. He expressed the opinion that they should not exceed 12 words in length! Heller (7) suggested that the adoption of a two-word name by Linnaeus was not a direct development from the frequent use of such names in the past. It was adapted from the type of citation he used for literature in his publications almost from the beginning.

Many of the “trivial names” (so-called since the differentia were still referred to as the true specific names) of plants were selected from some feature of the specific discussion—a word from the differentia, one referring to habitat, locus (country), etc. Others were obtained from various other sources. Frequently the names of genera placed

in synonymy by Linnaeus were used for trivial names—*Tulipifera* of Catesby became a species of *Liriodendron*, *Blatteria* of Bauhin one of *Verbascum*, and *Chamaedryis* Bauhin (in which several species had been placed) and *Bonatota* Micheli both were made species of *Veronica*. The common American corn was named *Mays* by Tournefort, but suppressed by Linnaeus in favor of *Zea*, and used as the trivial name.

TABLE 5. Numbers of genera and species of different groups listed by Linnaeus in the first (1735) and tenth (1758-59) editions of *Systema Naturae*.

	Edition 1. 1735 ¹		Edition X. 1758-59		
	Genera	Species	Genera	Species	Varieties ²
"Vegetabilia" -----	767	---	1174	6698	--
(Plants)					
"Animalia" -----	191	534	312	4289	--
(Animals)					
Mammalia -----	33	94	39	186	33
Aves -----	47	116	63	544	25
Amphibia -----	4	27	16	216	5
Pisces -----	41	148	51	378	3
Insecta -----	47	93	74	2031	--
Coleoptera -----	23	32	25	594	--
Hemiptera -----	7	13	8	197	--
Lepidoptera -----	9	22	3	535	--
Neuroptera -----			6	60	--
Hymenoptera -----			8	229	--
Diptera -----			10	188	--
Aptera -----	8	26	14	228	—
Vermes -----	19	64	69	934	27

¹ Species of plants were not listed in the first edition.

² Varieties were not counted in some groups as they were inconspicuously indicated and counting them was difficult.

³ In the first edition the Insecta were divided into four orders and the genera later placed in the Lepidoptera, Neuroptera, Hymenoptera and Diptera were called Angioptera.

The specific names chosen by Linnaeus for animals were more varied than those for plants. For mammals there were frequently enough classical names for both genus and all of the species. The Latin name *Felis* was selected for the genus of "cats", another, *catus*, for one species, and most of the other species had Latin or Greek names which he used—*leo*, *tigris*, *pardus* and *lynx*. Only 465 different names were used for the 544 species of birds listed in 1758, as some names were used several times. Some were classical names of mythological characters, others names of other birds and animals. Most appear to be adjectives, indicating country or region as *orientalis*, *lapponica*, *canadensis*, habitat as *montana*, *sylvatica*, *alpina*, color as *alba*, *chloris*, *fuscus*, anatomical features as *crustus* (used 11 times), *curvirostra*, etc. In the Insecta, names of all the types previously mentioned were used, sometimes after some method, but usually indiscriminately mixed. Heller (6) published an excellent analysis of the use of mythological names in the genus *Papilio*. Names of individuals of groups, as "Trojan and Greek horsemen", the nymphs, the graces,

the muses, the Argonauts, etc., were used for species of the systematic groups of the genus. However, the animal names of Linnaeus have been studied far less than his plant names and many interesting areas probably remain to be explored.

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APPENDIX I

Explanation of Tables 2-4

Tables 2-4 summarize information concerning the origin and/or derivation of the names of genera of selected groups of Indiana plants.

The four (three in Table 2) columns headed "Source of names as cited by" indicated the author to whom the name is attributed by the authorities named—Linn (11, 12, 13), Kew Ind (8), Gray (5), and Deam (3). The authors are indicated by initials: B—Bauhin, D—Dillenius, G—Gronovius, L—Linnaeus, P—Plumier, R—Royen and T—Tournefort. The Kew Index and Deam follow the Code of Nomenclature in considering "valid" naming of plants to begin with Linnaeus but use the "double" credit as described elsewhere in this paper. However, the Index cited eight different Linnean papers, published from 1735 to 1759, as valid sources for establishment of the several names. Gray did not use double credit and appears to have considered some names to have been established by Tournefort. Linnaeus did not indicate in any manner the names which he originated; those for which he cited no other author are considered to be his and are so marked, "(L)". Initials starred (*) in the column headed "Linn" identify names which Linnaeus synonymized, but were "resurrected" (or validated) by later authors.

Some of the information on the sources and significance of the names was obtained from Gray's Manual (5). The etymology, ancient meanings, gender, and authorities (ancient authors who used the words; only the most familiar are cited) were compiled, or checked, from the classical dictionaries (9, 10). Starred (*) derivations indicate names which appear to have been applied to the same plants in antiquity as now. Abbreviations: Gr—Greek, L—Latin, Med. L.—Medieval Latin, NL—Neo-Latin ("New Latin"); F—feminine, M—masculine, N—neuter; App.Herb.—a 4th Century (A.D.) Herbal erroneously attributed to Lucius Appuleius, a 2nd Century writer, Dsc.—Dioscorides, Hdt.—Herodotus, H(O)—Homer in the Odyssey, Hpp.—Hippocrates, Thphr.—Theophrastus.
