16. Bee Taxa and Categories

Classifications, of course, are based in large part on phylogeny. Some specialists (cladists) base classification entirely on phylogeny; others consider also information from diverse sources in developing a classification. No one, however, should presume to make a classification without having all available phylogenetic information. For practical purposes, I present here some information on bee classification, prior to the section on phylogeny, because use of the family-group names makes explanation and understanding easier. Recent phylogenetic studies have not overturned this classification in a major way; it is therefore possible to discuss phylogeny using for the most part the taxa that have been accepted in the past by many specialists. To provide ready reference to the classification that will be elaborated later, Table 16-1 lists the taxa (family to subgenus) here accepted.

In dealing with a large group such as the bees, it is inevitable that the classification will be unsatisfactory in some areas even though quite satisfying in others. This situation arises partly because of intrinsic differences among living bees. In some groups the taxa are well differentiated and easily organized hierarchically, whereas in other groups characters occur in diverse combinations among taxa difficult to differentiate and resistant to unambiguous classification. Another reason for differences in the usefulness of taxonomic constructs is the amount and kind of study to which each group (e.g., family) has been subjected. Some taxa have been analyzed phylogenetically, others have not, and some such analyses are convincing while others are not. Thus the parts of the classification differ in their usefulness. It has not been practical to make phylogenetic studies of all groups as part of the preparation of this book. Some such studies (Roig-Alsina and Michener, 1993; Alexander and Michener, 1995), published separately partly in order to present details not appropriate here, were made specifically in the hope of clarifying the family-level classification for this book.

The tradition has been to recognize large genera of bees, like *Andrena, Lasioglossum,* and *Megachile.* I believe this is desirable, for it allows many biologists to recognize the genera and know what is meant by the names. In the same way, I find names like *Culex, Aedes,* and *Drosophila* more useful to me, and I think to biologists in general, than the many generic names that would result if the many subgenera they comprise were all raised to generic rank.

A frequent result of maintaining large genera is the development of multiple subgenera. Melittologists are sometimes criticized for extensive use of subgenera. Species-groups, named informally with specific names, could be used instead of subgenera; such a procedure would avoid burdening the literature with numerous subgeneric names and their associated formalities such as type species and problems of homonymy. For large genera, however, with hundreds or thousands of species, the choice is not between recognizing a genus with subgenera vs. a genus with species groups. It is between recognizing a genus with subgenera vs. several or many genera, because many of the current subgenera are quite different from one another, sometimes recognizable on flowers or even in flight, and some specialists already prefer to recognize them as genera. I prefer, nonetheless, to retain inclusive genera for the reason indicated above. In the end, however, these decisions are subjective regardless of one's views on systematic methodology.

One of the advantages of subgenera is that they need not be cited. Unlike generic names, which are required, subgeneric names are optional parts of the scientific nomenclature of organisms. Thus, *Megachile (Eutricharaea) rotundata* can also be written *Megachile rotundata.* Anyone can simply ignore subgeneric names. It is fortunate that much of the activity of splitters therefore can be ignored by those who wish to do so; this tactic is more difficult when the taxa are called genera.

The appropriate genus-level classification varies among groups. In *Andrena,* in spite of its numerous subgenera, almost no modern author proposes elevating the subgenera to generic rank. In *Lasioglossum,* as explained in the account of that genus, certain authors do recognize subdivisions such as *Dialictus, Evylaeus,* and *Lasioglossum* s. str. as genera, although I consider them to be subgenera. Since there is no useful definition of genus or subgenus, such differences of opinion are matters of judgment about which there is no right or wrong interpretation. The Anthidiini, a group prone to striking morphological variables like carinae and lamellae on various parts of the body, have been broken up into numerous genera; a few recent authors (Warncke, Westrich) place most of its species in *Anthidium.* Finally, perhaps largely for historical reasons, the Eucerini are divided into many genera rather than subgenera of one huge genus. In the systematic part of this book I have tried to reduce the diversity of treatments both by uniting some genera in much "split" taxa and by breaking up a few taxa that have usually seemed "lumped," such as the old genus *Nomia.* The problem, of course, is that such efforts are largely subjective, because there is no objective basis for deciding whether two taxa are distinct from one another subgenerically, generically, tribally, or whatever. This is true, moreover, whether the taxa are recognized by phenetic differences or by phylogenetic positions. See Section 30.

No bee specialist will be satisfied with all aspects of Table 16-1. It does indicate the classification that will be used in the sections of this book concerned with systematics, i.e., Sections 36 to 121.

In Table 16-1 the authors of family-group names (superfamily to subtribe, or for our purposes, family to tribe) are given. Authors' names do not appear elsewhere. Traditionally less attention is given to them than for genus-group and species-group names, but details can be found in Michener (1986a), and repeated and updated in Engel (2005).

The total number of species placed to genus and subgenus, as indicated in Table 16-1, is about 17,500. As indicated elsewhere, there remain named species not placed to subgenus and not enumerated in the table. Thus in

genera like *Megachile, Coelioxys* (especially of South America), and *Eucera* s. l., many species remain unplaced as to subgenus and therefore are not included in Table 16-1. This situation is presumably worst in the little-studied parts of the world, where many species were named in past centuries, but modern treatments of such faunas scarcely exist. The number of described species of bees (not including those relegated to synonymy) may well be over 18,000, and new species yet to be found and named will probably exceed the number of new synonyms recognized. A guess as to the total number of bee species in the world is therefore near or above the often-mentioned figure of 20,000. Given the number of cryptic species that will probably be found with the advent of molecular methods and more careful morphological analyses, the total number of species could be even higher. I am indebted to Dr. John S. Ascher for data and discussion of these matters.

Table 16-1. The Recent Bee Taxa (Family to Subgenus).

This table gives the authors' names for the higher taxa, and estimates of the approximate numbers of included species for genera and subgenera. Depending on the status of the systematics of the particular group, these numbers are based on revisions, estimates, or merely number of specific names. They relate to named species but are often uncertain because revisors were not certain about the status of some names or because of unpublished synonymies or other findings. Isolated descriptions of new species were commonly ignored. The numbers in parentheses after family-group names are those of the corresponding text sections. Subgeneric names are in italics. At the end of the table are the totals. Fossil taxa are excluded; see Section 22.

Family **Stenotritidae** Cockerell(36)	
Ctenocolletes	10
Stenotritus	11
Family **Colletidae** Lepeletier (37)	
Subfamily Colletinae Lepeletier (38)	
Tribe Paracolletini (39)	
Brachyglossula	4
Callomelitta	11
Chrysocolletes	5
Eulonchopria	
Ethalonchopria	2
Eulonchopria s. str.	3
Glossurocolletes	2
Hesperocolletes	1
Leioproctus	
Actenosigynes	1
Albinapis	1
Andrenopsis	4
Baeocolletes	3
Cephalocolletes	5
Ceratocolletes	2
Chilicolletes	1
Cladocerapis	9
Colletellus	1
Colletopsis	1
Euryglossidia	22
Excolletes	1
Filiglossa	4
Glossopasiphae	1
Goniocolletes	21
Halictanthrena	1
Hexantheda	2
Holmbergeria	2
Hoplocolletes	1
Kylopasiphae	1
Lamprocolletes	18
Leioproctus s. str.	125
Nesocolletes	5
Nomiocolletes	5
Odontocolletes	8
Perditomorpha	45
Protodiscelis	5
Protomorpha	9
Pygopasiphae	2
Reedapis	3
Sarocolletes	6
Spinolapis	3
Tetraglossula	5
Torocolletes	2
Urocolletes	1
Lonchopria	
Biglossa	9
Ctenosibyne	1
Lonchoprella	1
Lonchopria s. str.	3
Porterapis	1
Lonchorhyncha	1
Neopasiphae	3
Niltonia	1
Paracolletes	
Anthoglossa	8
Paracolletes s. str.	8
Phenacolletes	1
Trichocolletes	
Callocolletes	1
*Trichocllete*s s. str.	22
Tribe Colletini Lepeletier (40)	
Colletes	330
Mourecotelles	
Hemicotelles	2
Mourecotelles s. str.	8
Xanthocotelles	11
Tribe Scraptrini Melo and Gonçalves (41)	
Scrapter	31
Subfamily Diphaglossinae Vachal (42)	
Tribe Caupolicanini Michener (43)	
Caupolicana	
Alayoapis	3
Caupolicana s. str.	31
Willinkapis	1
Zikanapis	11
Crawfordapis	1
Ptiloglossa	40
Tribe Diphaglossini Vachal (44)	
Cadeguala	2
Cadegualina	2
Diphaglossa	1
Tribe Dissoglottini Moure (45)	
Mydrosoma	9
Mydrosomella	1
Ptiloglossidia	1
Subfamily Xeromelissinae Cockerell (46)	
Chilicola	
Anoediscelis	19
Chilicola s. str.	4
Chilioediscelis	3
Hylaeosoma	10
Oediscelis	20
Oroediscelis	7
Prosopoides	2
Pseudiscelis	2
Chilimelissa	18
Geodiscelis	2
Xenochilicola	3
Xeromelissa	1
Subfamily Hylaeinae Viereck (47)	
Amphylaeus	
Agogenohylaeus	3
Amphylaeus s. str.	1
Calloprosopis	1
Hemirhiza	1
Hylaeus	
Abrupta	1
Alfkenylaeus	5
Analastoroides	1
Cephalylaeus	2
Cephylaeus	1
Cornylaeus	2
Dentigera	20
Deranchylaeus	49
Edriohylaeus	1
Euprosopellus	4
Euprosopis	5
Euprosopoides	10
Gephyrohylaeus	3

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

Subfamily Hylaeinae *(continued)*
- *Gnathoprosopis* 7
- *Gnathoprosopoides* 2
- *Gnathylaeus* 1
- *Gongyloprosopis* 5
- *Heterapoides* 8
- *Hoploprosopis* 1
- *Hylaeana* 9
- *Hylaeopsis* 25
- *Hylaeorhiza* 1
- *Hylaeteron* 5
- *Hylaeus* s. str. 92
- *Koptogaster* 2
- *Laccohylaeus* 1
- *Lambdopsis* 18
- *Macrohylaeus* 1
- *Meghylaeus* 1
- *Mehelyana* 1
- *Metylaeus* 6
- *Metziella* 1
- *Nesoprosopis* 68
- *Nesylaeus* 1
- *Nothylaeus* 34
- *Orohylaeus* 1
- *Paraprosopis* 47
- *Planihylaeus* 5
- *Prosopella* 1
- *Prosopis* 46
- *Prosopisteroides* 4
- *Prosopisteron* 76
- *Pseudhylaeus* 5
- *Rhodohylaeus* 21
- *Spatulariella* 18
- *Sphaerhylaeus* 2
- *Xenohylaeus* 4
- Hyleoides 8
- Meroglossa 20
- Palaeorhiza
  - *Anchirhiza* 2
  - *Callorhiza* 40
  - *Ceratorhiza* 2
  - *Cercorhiza* 13
  - *Cheesmania* 3
  - *Cnemidorhiza* 20
  - *Eupalaeorhiza* 3
  - *Eusphecogastra* 3
  - *Gressittapis* 2
  - *Hadrorhiza* 3
  - *Heterorhiza* 12
  - *Michenerapis* 1
  - *Noonadania* 2
  - *Palaeorhiza* s. str. 15
  - *Paraheterorhiza* 2
  - *Trachyrhiza* 1
  - *Zarhiopalea* 5
- Pharohylaeus 2
- Xenorhiza 5

Subfamily Euryglossinae Michener (48)
- Brachyhesma
  - *Anomalohesma* 1
  - *Brachyhesma* s. str. 22
  - *Henicohesma* 2
  - *Microhesma* 16
- Callohesma 34
- Dasyhesma 21
- Euhesma
  - *Euhesma* s. str. 65
  - *Parahesma* 1
- Euryglossa 36
- Euryglossina
  - *Euryglossella* 8
  - *Euryglossina* s. str. 54
  - *Microdontura* 1
  - *Pachyprosopina* 1
  - *Quasihesma* 10
- Euryglossula 7
- Heterohesma 2
- Hyphesma 7
- Melittosmithia 4
- Pachyprosopis
  - *Pachyprosopis* s. str. 7
  - *Pachyprosopula* 7
  - *Parapachyprosopis* 9
- Sericogaster 1
- Stenohesma 1
- Tumidihesma 2
- Xanthesma
  - *Argohesma* 8
  - *Chaetohesma* 10
  - *Xanthesma* s. str. 13
  - *Xenohesma* 17

Family **Andrenidae** Latreille (49)

Subfamily Alocandreninae Michener (50)
- Alocandrena 1

Subfamily Andreninae Latreille (51)
- Ancylandrena 5
- Andrena
  - *Aciandrena* 26
  - *Aenandrena* 7
  - *Agandrena* 3
  - *Anchandrena* 2
  - *Andrena* s. str. 83
  - *Aporandrena* 2
  - *Archiandrena* 3
  - *Augandrena* 3
  - *Avandrena* 7
  - *Belandrena* 5
  - *Biareolina* 1
  - *Brachyandrena* 4
  - *Callandrena* 79
  - *Calomelissa* 6
  - *Campylogaster* 14
  - *Carandrena* 39
  - *Carinandrena* 1
  - *Celetandrena* 1
  - *Charitandrena* 2
  - *Chlorandrena* 49
  - *Chrysandrena* 14
  - *Cnemidandrena* 45
  - *Conandrena* 2
  - *Cordandrena* 7
  - *Cremnandrena* 1
  - *Cryptandrena* 5
  - *Cubiandrena* 2
  - *Dactylandrena* 4
  - *Dasyandrena* 3
  - *Derandrena* 10
  - *Diandrena* 25
  - *Didonia* 7
  - *Distandrena* 11
  - *Erandrena* 1
  - *Euandrena* 74
  - *Fumandrena* 11
  - *Fuscandrena* 1
  - *Geissandrena* 1
  - *Genyandrena* 2
  - *Gonandrena* 6
  - *Graecandrena* 20
  - *Habromelissa* 1
  - *Hesperandrena* 9
  - *Holandrena* 16
  - *Hoplandrena* 23
  - *Hyperandrena* 2
  - *Iomelissa* 1
  - *Larandrena* 7
  - *Leimelissa* 4
  - *Lepidandrena* 18
  - *Leucandrena* 16
  - *Longandrena* 3
  - *Malayapis* 1
  - *Margandrena* 7
  - *Melanapis* 4
  - *Melandrena* 64
  - *Melittoides* 4
  - *Micrandrena* 103
  - *Nemandrena* 3
  - *Nobandrena* 13
  - *Notandrena* 16
  - *Oligandrena* 2
  - *Onagrandrena* 24
  - *Orandrena* 24
  - *Oreomelissa* 13
  - *Osychnyukandrena* 2
  - *Oxyandrena* 1
  - *Pallandrena* 4
  - *Parandrena* 13
  - *Parandrenella* 8
  - *Pelicandrena* 1
  - *Planiandrena* 4
  - *Plastandrena* 33
  - *Poecilandrena* 29
  - *Poliandrena* 33
  - *Psammandrena* 2
  - *Ptilandrena* 13
  - *Rhacandrena* 4
  - *Rhaphandrena* 3
  - *Rufandrena* 2

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

- Subfamily Andreninae *(continued)*
  - *Scaphandrena* 53
  - *Scitandrena* 1
  - *Scoliandrena* 2
  - *Scrapteropsis* 18
  - *Simandrena* 41
  - *Stenomelissa* 3
  - *Suandrena* 11
  - *Taeniandrena* 23
  - *Tarsandrena* 6
  - *Thysandrena* 21
  - *Trachandrena* 30
  - *Troandrena* 5
  - *Tylandrena* 14
  - *Ulandrena* 31
  - *Xiphandrena* 1
  - *Zonandrena* 17
  - Euherbstia 1
  - Megandrena
    - *Erythrandrena* 1
    - *Megandrena* s. str. 1
  - Orphana 2
- Subfamily Panurginae Leach (52)
  - Tribe Protandrenini Robertson (53)
    - Anthemurgus 1
    - Anthrenoides 30
    - Chaeturginus 2
    - Liphanthus
      - *Leptophanthus* 7
      - *Liphanthus* s. str. 4
      - *Melaliphanthus* 2
      - *Neoliphanthus* 1
      - *Pseudoliphanthus* 4
      - *Tricholiphanthus* 3
      - *Xenoliphanthus* 4
    - Neffapis 1
    - Parapsaenythia 2
    - Protandrena
      - *Austropanurgus* 1
      - *Heterosarus* 59
      - *Metapsaenythia* 2
      - *Parasarus* 1
      - *Protandrena* s. str. 50
      - *Pterosarus* 40
    - Psaenythia 80
    - Pseudopanurgus 32
    - Rhophitulus
      - *Cephalurgus* 5
      - *Panurgillus* 21
      - *Rhophitulus* s. str. 3
    - Incertae Sedis
      - *Stenocolletes* 1
  - Tribe Panurgini Leach (54)
    - Avpanurgus 1
    - Camptopoeum
      - *Camptopoeum* s. str. 13
      - *Epimethea* 12
    - Panurginus 49
    - Panurgus
      - *Flavipanurgus* 5
      - *Panurgus* s. str. 30
      - *Simpanurgus* 1
  - Tribe Nolanomelissini (55)
    - *Nolanomelissa* 1
  - Tribe Melitturgini Newman (56)
    - Borgatomelissa 2
    - Flavomeliturgula 6
    - Gasparinahla 1
    - Melitturga 13
    - Meliturgula 11
    - Mermiglossa 1
    - Plesiopanurgus 4
  - Tribe Protomeliturgini Ruz (57)
    - Protomeliturga 1
  - Tribe Perditini Robertson (58)
    - Macrotera
      - *Cockerellula* 13
      - *Macrotera* s. str. 6
      - *Macroterella* 6
      - *Macroteropsis* 6
    - Perdita
      - *Allomacrotera* 2
      - *Alloperdita* 6
      - *Callomacrotera* 2
      - *Cockerellia* 25
      - *Epimacrotera* 18
      - *Glossoperdita* 4
      - *Hesperoperdita* 3
      - *Heteroperdita* 13
      - *Hexaperdita* 29
      - *Pentaperdita* 13
      - *Perdita* s. str. 441
      - *Perditella* 7
      - *Procockerellia* 5
      - *Pseudomacrotera* 1
      - *Pygoperdita* 43
      - *Xeromacrotera* 1
      - *Xerophasma* 2
  - Tribe Calliopsini Robertson (59)
    - Acamptopoeum 11
    - Arhysosage 6
    - Calliopsis
      - *Calliopsima* 15
      - *Calliopsis* s. str. 12
      - *Ceroliopoeum* 1
      - *Hypomacrotera* 3
      - *Liopoeodes* 1
      - *Liopoeum* 4
      - *Micronomadopsis* 20
      - *Nomadopsis* 13
      - *Perissander* 7
      - *Verbenapis* 4
    - Callonychium
      - *Callonychium* s. str. 6
      - *Paranychium* 5
    - Litocalliopsis 1
    - Spinoliella 6
- Subfamily Oxaeinae Ashmead (60)
  - Mesoxaea 7
  - Notoxaea 1
  - Oxaea 8
  - Protoxaea 3

Family **Halictidae** Thomson (61)

- Subfamily Rophitinae Schenck (62)
  - Ceblurgus 1
  - Conanthalictus
    - *Conanthalictus* s. str. 2
    - *Phaceliapis* 11
  - Dufourea 130
  - Goeletapis 1
  - Micralictoides 8
  - Morawitzella 1
  - Morawitzia 3
  - Penapis 3
  - Protodufourea 5
  - Rophites
    - *Flavodufourea* 2
    - *Rhophitoides* 4
    - *Rophites* s. str. 13
  - Sphecodosoma
    - *Michenerula* 1
    - *Sphecodosoma* s. str. 2
  - Systropha 25
  - Xeralictus 2
- Subfamily Nomiinae Robertson (63)
  - Dieunomia
    - *Dieunomia* s. str. 5
    - *Epinomia* 4
  - Halictonomia 10
  - Lipotriches
    - *Afronomia* 7
    - *Austronomia* 102
    - *Clavinomia* 1
    - *Lipotriches* s. str. 99
    - *Macronomia* 45
    - *Maynenomia* 1
    - *Melanomia* 2
    - *Nubenomia* 15
    - *Trinomia* 6
  - Mellitidia 19
  - Nomia
    - *Acunomia* 33
    - *Crocisaspidia* 11
    - *Hoplonomia* 20
    - *Leuconomia* 39
    - *Nomia* s. str. 6
    - *Paulynomia* 2
  - Pseudapis
    - *Pachynomia* 4
    - *Pseudapis* s. str. 69
  - Ptilonomia 3
  - Reepenia 3
  - Spatunomia 2
  - Sphegocephala 6
  - Steganomus 7
- Subfamily Nomioidinae Börner (64)
  - Cellariella 2

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

Subfamily Nomioidinae *(continued)*	
Ceylalictus	
Atronomioides	11
Ceyalictus s. str.	13
Meganomioides	2
Nomioides	60
Subfamily Halictinae Thomson (65)	
Tribe Halictini Thomson (66)	
Agapostemon	
Agapostemon s. str.	43
Agapostemonoides	1
Caenohalictus	55
Dinagapostemon	8
Echthralictus	2
Eupetersia	
Eupetersia s. str.	21
Nesoeupetersia	8
Glossodialictus	1
Habralictus	
Habralictus s. str.	21
Zikaniella	1
Halictus	
Argalictus	8
Halictus s. str.	4
Hexataenites	11
Lampralictus	1
Monilapis	31
Nealictus	2
Odontalictus	2
Pachyceble	22
Paraseladonia	1
Platyhalictus	14
Protohalictus	13
Ramalictus	1
Seladonia	36
Tytthalictus	4
Vestitohalictus	35
Homalictus	
Homalictus s. str.	94
Papualictus	6
Quasilictus	1
Lasioglossum	
Acanthalictus	1
Australictus	11
Austrevylaeus	19
Callalictus	8
Chilalictus	134
Ctenonomia	196
Dialictus	465
Eickwortia	2
Evylaeus	60
Glossalictus	1
Hemihalictus	1
Lasioglossum s. str.	162
Paradialictus	1
Parasphecodes	99
Pseudochilalictus	1
Sellalictus	35
Sphecodogastra	8
Sudila	6
Mexalictus	5
Microsphecodes	7
Nesosphecodes	3
Paragapostemon	1
Parathrincostoma	2
Patellapis	
Archihalictus	16
Chaetalictus	35
Dictyohalictus	12
Lomatalictus	4
Pachyhalictus	30
Patellapis s. str.	5
Zonalictus	68
Pseudagapostemon	
Brasilagapostemon	3
Neagapostemon	6
Pseudagapostemon s. str.	16
Ptilocleptis	3
Rhinetula	1
Ruizantheda	4
Sphecodes	285
Thrincohalictus	1
Thrinchostoma	
Diagonozus	5
Eothrincostoma	7
Thrinchostoma s. str.	44
Urohalictus	1
Tribe Augochlorini Beebe (67)	
Andinaugochlora	
Andinaugochlora s. str.	2
Neocorynurella	2
Ariphanarthra	1
Augochlora	
Augochlora s. str.	86
Oxystoglossella	27
Augochlorella	
Augochlorella s. str.	15
Ceratalictus	5
Pereirapis	6
Augochlorodes	1
Augochloropsis	
Augochloropsis s. str.	46
Paraugochloropsis	92
Caenaugochlora	
Caenaugochlora s. str.	13
Ctenaugochlora	4
Chlerogas	9
Chlerogella	
Chlerogella s. str.	15
Ischnomelissa	7
Chlerogelloides	2
Corynura	
Callistochlora	3
Corynura s. str.	18
Halictillus	2
Megalopta	
Megalopta s. str.	27
Noctoraptor	3
Megaloptidia	3
Megaloptilla	3
Megommation	
Cleptommation	1
Megaloptina	2
Megommation s. str.	1
Stilbochlora	1
Micrommation	1
Neocorynura	65
Paroxystoglossa	9
Pseudaugochlora	7
Rhectomia	4
Rhinocorynura	5
Temnosoma	7
Thectochlora	1
Xenochlora	4
Family **Melittidae** Schenck (68)	
Subfamily Dasypodainae Börner (69)	
Tribe Dasypodaini Börner (70)	
Dasypoda	35
Eremaphanta	
Eremaphanta s. str.	6
Popovapis	2
Hesperapis	
Ambylapis	6
Capicola	6
Capicoloides	1
Carinapis	7
Disparapis	1
Hesperapis s. str.	1
Panurgomia	6
Xeralictoides	1
Zacesta	1
Tribe Promelittini Michener (71)	
Afrodasypoda	1
Promelitta	1
Tribe Sambini Michener (72)	
Haplomelitta	
Atrosamba	1
Haplomelitta s. str.	1
Haplosamba	1
Metasamba	1
Prosamba	1
Samba	1
Subfamily Meganomiinae Michener (73)	
Ceratomonia	1
Meganomia	4
Pseudophilanthus	
Dicromonia	1
Pseudophilanthus s. str.	3
Uromonia	
Nesomonia	1
Uromonia s. str.	1
Subfamily Melittinae Schenk (74)	
Macropis	
Macropis s. str.	10
Paramacropis	1
Sinomacropis	5

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

Subfamily Melittinae *(continued)*
- Melitta
  - *Dolichochile* 1
  - *Melitta* s. str. 26
- Rediviva 21
- Redivivoides 1

Family **Megachilidae** Latreille (75)

Subfamily Fideliinae Cockerell (76)
- Tribe Pararhophitini Popov (77)
  - Pararhophites 3
- Tribe Fideliini Cockerell (78)
  - Fidelia
    - *Fidelia* s. str. 3
    - *Fideliana* 2
    - *Fideliopsis* 5
    - *Parafidelia* 2
  - Neofidelia 2

Subfamily Megachilinae Latreille (79)
- Tribe Lithurgini Newman (80)
  - Lithurgus
    - *Lithurgopsis* 11
    - *Lithurgus* s. str. 15
  - Microthurge 4
  - Trichothurgus 13
- Tribe Osmiini Newman (81)
  - Afroheriades 5
  - Ashmeadiella
    - *Arogochila* 18
    - *Ashmeadiella* s. str. 33
    - *Chilosima* 2
    - *Cubitognatha* 1
    - *Isosmia* 2
  - Atoposmia
    - *Atoposmia* s. str. 12
    - *Eremosmia* 14
    - *Hexosmia* 2
  - Bekilia 1
  - Chelostoma
    - *Ceraheriades* 1
    - *Chelostoma* s. str. 27
    - *Eochelostoma* 1
    - *Foveosmia* 19
    - *Gyrodromella* 6
    - *Prochelostoma* 1
  - Haetosmia 3
  - Heriades
    - *Amboheriades* 11
    - *Heriades* s. str. 46
    - *Michenerella* 32
    - *Neotrypetes* 13
    - *Pachyheriades* 5
    - *Rhopaloheriades* 1
    - *Toxeriades* 1
    - *Tyttheriades* 1
  - Hofferia 2
  - Hoplitis
    - *Acrosmia* 5
    - *Alcidamea* 72
    - *Annosmia* 31
    - *Anthocopa* 74
    - *Bytinskia* 4
    - *Chlidoplitis* 2
    - *Coloplitis* 2
    - *Cyrtosmia* 1
    - *Dasyosmia* 2
    - *Euryparietella* 1
    - *Exanthocopa* 1
    - *Formicapis* 1
    - *Hoplitina* 6
    - *Hoplitis* s. str. 43
    - *Jaxartinula* 2
    - *Kumobia* 4
    - *Megahoplitis* 1
    - *Megalosmia* 4
    - *Microhoplitis* 1
    - *Monumetha* 6
    - *Nasutosmia* 2
    - *Pentadentosmia* 24
    - *Penteriades* 2
    - *Platosmia* 8
    - *Prionohoplitis* 6
    - *Proteriades* 22
    - *Robertsonella* 3
  - Hoplosmia
    - *Hoplosmia* s. str. 3
    - *Odontanthocopa* 9
    - *Paranthocopa* 1
  - Noteriades 9
  - Ochreriades 2
  - Osmia
    - *Acanthosmioides* 22
    - *Allosmia* 3
    - *Cephalosmia* 5
    - *Diceratosmia* 5
    - *Erythrosmia* 13
    - *Euthosmia* 1
    - *Helicosmia* 81
    - *Hemiosmia* 6
    - *Melanosmia* 108
    - *Metallinella* 1
    - *Monosmia* 1
    - *Mystacosmia* 1
    - *Neosmia* 8
    - *Orientosmia* 1
    - *Osmia* s. str. 22
    - *Ozbekosmia* 1
    - *Pyrosmia* 33
    - *Tergosmia* 6
    - *Trichinosmia* 1
  - Othinosmia
    - *Afrosmia* 1
    - *Megaloheriades* 7
    - *Othinosmia* s. str. 5
  - Protosmia
    - *Chelostomopsis* 4
    - *Dolichosmia* 1
    - *Nanosmia* 6
    - *Protosmia* s. str. 19
  - Pseudoheriades 7
  - Stenoheriades 10
  - Stenosmia 11
  - Wainia
    - *Caposmia* 4
    - *Wainia* s. str. 3
    - *Wainiella* 2
  - Xeroheriades 1
- Tribe Anthidiini Ashmead (82)
  - Acedanthidium 1
  - Afranthidium
    - *Afranthidium* s. str. 9
    - *Branthidium* 10
    - *Capanthidium* 12
    - *Domanthidium* 1
    - *Immanthidium* 5
    - *Mesanthidiellum* 3
    - *Mesanthidium* 8
    - *Nigranthidium* 2
    - *Oranthidium* 3
    - *Xenanthidium* 1
    - *Zosteranthidium* 1
  - Afrostelis 5
  - Anthidiellum
    - *Ananthidiellum* 1
    - *Anthidiellum* s. str. 7
    - *Chloranthidiellum* 1
    - *Clypanthidium* 3
    - *Loyolanthidium* 8
    - *Pycnanthidium* 22
    - *Ranthidiellum* 2
  - Anthidioma 1
  - Anthidium
    - *Anthidium* s. str. 75
    - *Callanthidium* 2
    - *Gulanthidium* 1
    - *Nivanthidium* 1
    - *Proanthidium* 8
    - *Severanthidium* 10
    - *Turkanthidium* 5
  - Anthodioctes
    - *Anthodioctes* s. str. 36
    - *Bothranthidium* 1
  - Apianthidium 1
  - Aspidosmia 2
  - Austrostelis 8
  - Aztecanthidium 3
  - Bathanthidium
    - *Bathanthidium* s. str. 1
    - *Manthidium* 1
    - *Stenanthidiellum* 2
  - Benanthis 2
  - Cyphanthidium 2
  - Dianthidium
    - *Adanthidium* 4
    - *Deranchanthidium* 2
    - *Dianthidium* s. str. 20
    - *Mecanthidium* 2
  - Duckeanthidium 5

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

Subfamily Megachilinae *(continued)*	
Eoanthidium	
Clistanthidium	5
Eoanthidium s. str.	6
Hemidiellum	1
Salemanthidium	2
Epanthidium	
Ananthidium	2
Carloticola	3
Epanthidium s. str.	18
Euaspis	12
Gnathanthidium	1
Hoplostelis	
Hoplostelis s. str.	3
Rhynostelis	1
Hypanthidioides	
Anthidulum	4
Ctenanthidium	4
Dichanthidium	1
Dicranthidium	6
Hypanthidioides s. str.	1
Larocanthidium	10
Michanthidium	2
Mielkeanthidium	2
Moureanthidium	5
Saranthidium	7
Hypanthidium	
Hypanthidium s. str.	16
Tylanthidium	1
Icteranthidium	25
Indanthidium	1
Larinostelis	1
Neanthidium	1
Notanthidium	
Allanthidium	6
Chrisanthidium	3
Notanthidium s. str.	1
Pachyanthidium	
Ausanthidium	1
Pachyanthidium s. str.	11
Trichanthidiodes	1
Trichanthidium	3
Paranthidium	
Paranthidium s. str.	4
Rapanthidium	1
Plesianthidium	
Carinanthidium	1
Plesianthidium s. str.	1
Spinanthidiellum	2
Spinanthidium	5
Pseudoanthidium	
Exanthidium	4
Micranthidium	3
Pseudoanthidium s. str.	18
Royanthidium	6
Semicarinella	1
Tuberanthidium	4
Rhodanthidium	
Asianthidium	7
Meganthidium	1
Rhodanthidium s. str.	5
Serapista	4
Stelis	
Dolichostelis	6
Heterostelis	9
Malanthidium	1
Protostelis	1
Pseudostelis	3
Stelidomorpha	3
Stelis s. str.	75
Trachusa	
Archianthidium	7
Congotrachusa	1
Heteranthidium	13
Legnanthidium	1
Massanthidium	3
Metatrachusa	2
Orthanthidium	1
Paraanthidium	7
Trachusa s. str.	1
Trachusomimus	2
Ulanthidium	6
Trachusoides	1
Xenostelis	1
Tribe Dioxyini Cockerell (83)	
Aglaoapis	3
Allodioxys	4
Dioxys	15
Ensliniana	3
Eudioxys	2
Metadioxys	3
Paradioxys	2
Prodioxys	3
Tribe Megachilini Latreille (84)	
Coelioxys	
Acrocoelioxys	25
Allocoelioxys	45
Boreocoelioxys	17
Coelioxys s. str.	52
Cyrtocoelioxys	39
Glyptocoelioxys	50
Haplocoelioxys	5
Liothyrapis	35
Mesocoelioxys	1
Neocoelioxys	7
Platycoelioxys	1
Rhinocoelioxys	5
Synocoelioxys	5
Torridapis	14
Xerocoelioxys	10
Megachile	
Acentron	11
Amegachile	30
Argyropile	7
Austrochile	10
Austromegachile	25
Callomegachile	91
Cestella	1
Chalicodoma	31
Chalicodomoides	2
Chelostomoda	14
Chelostomoides	31
Chrysosarus	25
Creightonella	50
Cressoniella	12
Cuspidella	1
Dasymegachile	20
Eumegachile	1
Eutricharaea	236
Gronoceras	10
Grosapis	1
Hackeriapis	90
Heriadopsis	1
Largella	3
Leptorachis	30
Litomegachile	7
Matangapis	1
Maximegachile	2
Megachile s. str.	9
Megachiloides	60
Megella	3
Melanosarus	8
Mitchellapis	6
Moureapis	8
Neochelynia	5
Neocressoniella	2
Paracella	39
Parachalicodoma	1
Platysta	2
Pseudocentron	55
Pseudomegachile	80
Ptilosaroides	1
Ptilosarus	9
Rhodomegachile	3
Rhyssomegachile	1
Sayapis	18
Schizomegachile	1
Schrottkyapis	1
Stelodides	1
Stenomegachile	4
Thaumatosoma	2
Trichurochile	1
Tylomegachile	2
Xanthosarus	26
Zonomegachile	2
Radoszkowskiana	4
Incertae Sedis	
Neochalicodoma	2
Stellenigris	1
Family **Apidae** Latreille (85)	
Subfamily Xylocopinae Latreille (86)	
Tribe Manueliini Sakagami & Michener (87)	
Manuelia	3
Tribe Xylocopini Latreille (88)	

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

Subfamily Xylocopinae *(continued)*	
Xylocopa	
Alloxylocopa	6
Biluna	5
Bomboixylocopa	5
Cirroxylocopa	1
Copoxyla	4
Ctenoxylocopa	6
Dasyxylocopa	1
Diaxylocopa	1
Gnathoxylocopa	1
Koptortosoma	196
Lestis	2
Maaiana	6
Mesotrichia	23
Monoxylocopa	1
Nanoxylocopa	1
Neoxylocopa	49
Nodula	7
Notoxylocopa	2
Nyctomelitta	3
*Prosopoxylocop*a	1
Proxylocopa	16
Rhysoxylocopa	8
Schonnherria	29
Stenoxylocopa	6
Xenoxylocopa	3
Xylocopa s. str.	8
Xylocopoda	2
Xylocopoides	6
Xylocopsis	1
Xylomelissa	65
Zonohirsuta	4
Tribe Ceratinini Latreille (89)	
Ceratina	
Calloceratina	10
Catoceratina	1
Ceratina s. str.	20
Ceratinidia	26
Ceratinula	30
Chloroceratina	2
Copoceratina	2
Crewella	12
Ctenoceratina	10
Euceratina	16
Hirashima	4
Lioceratina	7
Malgatina	1
Megaceratina	1
Neoceratina	8
Pithitis	9
Protopithitis	1
Rhysoceratina	2
Simiceratina	3
Xanthoceratina	9
Zadontomerus	25
Tribe Allodapini Cockerell (90)	
Allodape	30
Allodapula	
Allodapula s. str.	9
Allodapulodes	4
Dalloapula	2
Braunsapis	87
Compsomelissa	
Compsomelissa s. str.	6
Halterapis	22
Effractapis	1
Eucondylops	2
Exoneura	
Brevineura	26
Exoneura s. str.	40
Inquilina	2
Exoneurella	4
Exoneuridia	
Alboneuridia	1
Exoneuridia s. str.	2
Macrogalea	11
Nasutapis	1
Subfamily Nomadinae Latreille (91)	
Tribe Hexepeolini Roig-Alsina & Michener (92)	
Hexepeolus	1
Tribe Brachynomadini Roig-Alsina & Michener (93)	
Brachynomada	
Brachynomada s. str.	8
Melanomada	7
Kelita	
Kelita s. str.	4
Spinokelita	1
Paranomada	3
Trichonomada	1
Triopasites	2
Tribe Nomadini Latreille (94)	
Nomada	795
Tribe Epeolini Robertson (95)	
Doeringiella	35
Epeolus	109
Odyneropsis	
Odyneropsis s. str.	10
Parammobates	4
Pseudepeolus	5
Rhinepeolus	1
Rhogepeolus	5
Thalestria	1
Triepeolus	141
Tribe Ammobatoidini Michener (96)	
Aethammobates	1
Ammobatoides	6
Holcopasites	16
Schmiedeknechtia	5
Tribe Biastini Linsley & Michener (97)	
Biastes	4
Neopasites	
Micropasites	3
Neopasites s. str.	2
Rhopalolemma	2
Tribe Townsendiellini Michener (98)	
Townsendiella	3
Tribe Neolarrini Fox (99)	
Neolarra	
Neolarra s. str.	11
Phileremulus	3
Tribe Ammobatini Handlirsch (100)	
Ammobates	
Ammobates s. str.	30
Euphileremus	7
Xerammobates	3
Melanempis	5
Oreopasites	11
Parammobatodes	7
Pasites	21
Sphecodopsis	
Pseudodichroa	2
Sphecodopsis s. str.	8
Spinopasites	1
Tribe Caenoprosopidini Michener (101)	
Caenoprosopina	1
Caenoprosopis	1
Subfamily Apinae Latreille (102)	
Tribe Isepeolini Rozen, Eickwort, & Eickwort (103)	
Isepeolus	11
Melectoides	10
Tribe Osirini Handlirsch (104)	
Epeoloides	2
Osirinus	7
Osiris	21
Parepeolus	
Ecclitodes	1
Parepeolus s. str.	4
Protosiris	4
Tribe Protepeolini Linsley & Michener (105)	
Leiopodus	5
Tribe Exomalopsini Vachal (106)	
Anthophorula	
Anthophorisca	29
Anthophorula s. str.	29
Isomalopsis	2
Chilimalopsis	2
Eremapis	1
Exomalopsis	
Diomalopsis	2
Exomalopsis s. str.	55
Phanomalopsis	15
Stilbomalopsis	13
Teratognatha	1
Tribe Ancylini Michener (107)	
Ancyla	10
Tarsalia	7
Tribe Tapinotaspidini Roig-Alsina & Michener (108)	
Arhysoceble	5
Caenonomada	3
Chalepogenus	
Chalepogenus s. str.	21
Lanthanomelissa	5

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

Subfamily Apinae *(continued)*	
Monoeca	6
Paratetrapedi*a*	
Amphipedia	1
Lophopedia	7
Paratetrapedia s. str.	14
Tropidopedia	2
Xanthopedia	5
Tapinotaspis	3
Tapinotaspoides	4
Trigonopedia	4
Tribe Tetrapediini Michener & Moure (109)	
Coelioxoides	3
Tetrapedia	13
Tribe Ctenoplectrini Cockerell (110)	
Ctenoplectra	24
Ctenoplectrina	2
Tribe Emphorini Robertson (111)	
Alepidoscelis	6
Ancyloscelis	25
Diadasia	45
Diadasina	
Diadasina s. str.	4
Leptometriella	*3*
Meliphilopsis	2
Melitoma	10
Melitomella	3
Ptilothrix	13
Toromelissa	1
Tribe Eucerini Latreille (112)	
Agapanthinus	1
Alloscirtetica	
Alloscirtetica s. str.	36
Megascirtetica	1
Canephorula	1
Cemolobus	1
Cubitalia	
Cubitalia s. str.	4
Opacula	1
Pseudeucera	1
Eucera	
Eucera s. str.	50
Hetereucera	60
Oligeucera	1
Pteneucera	8
Synhalonia	104
Eucerinoda	1
Florilegus	
Euflorilegus	5
Florilegus s. str.	5
Floriraptor	1
Gaesischia	
Dasyhalonia	2
Gaesischia s. str.	19
Gaesischiana	3
Gaesischiopsis	7
Pachyhalonia	3
Prodasyhalonia	1
Gaesochira	1
Hamatothrix	1
Lophothygater	1
Martinapis	
Martinapis s. str.	2
Svastropsis	1
Melissodes	
Apomelissodes	4
Callimelissodes	14
Ecplectica	8
Eumelissodes	72
Heliomelissodes	2
Melissodes s. str.	23
Psilomelissodes	1
Tachymelissodes	3
Melissoptila	60
Micronychapis	1
Mirnapis	1
Notolonia	1
Pachysvastra	1
Peponapis	13
Platysvastra	1
Santiago	2
Simanthedon	1
Svastra	
Anthedonia	2
Brachymelissodes	2
Epimelissodes	13
Idiomelissodes	1
Svastra s. str.	3
Svastrides	4
Svastrina	1
Syntrichalonia	2
Tetralonia	
Eucara	7
Tetralonia s. str.	1
Thygatina	9
Tetraloniella	
Glazunovia	1
Loxoptilus	2
Pectinapis	4
Tetraloniella s. str.	115
Thygater	
Nectarodiaeta	2
Thygater s. str.	23
Trichocerapis	
Dithygater	1
Trichocerapis s. str.	5
Ulugombakia	1
Xenoglossa	
Eoxenoglossa	2
Xenoglossa s. str.	5
Tribe Anthophorini Dahlbom (113)	
Amegilla	253
Anthophora	
Anthomegilla	8
Anthophora s. str.	11
Anthophoroides	6
Caranthophora	6
Clisodon	2
Dasymegilla	6
Heliophila	91
Lophanthophora	33
Melea	9
Mystacanthophora	19
Paramegilla	66
Petalosternon	21
Pyganthophora	66
Rhinomegilla	4
Deltoptila	10
Elaphropoda	6
Habrophorula	3
Habropoda	50
Pachymelus	
Pachymelopsis	5
Pachymelus s. str.	15
Tribe Centridini Cockerell & Cockerell (114)	
Centris	
Acritocentris	4
Aphemisia	3
Centris s. str.	35
Exallocentris	1
Heterocentris	17
Melacentris	18
Paracentris	25
Ptilocentris	1
Ptilotopus	12
Schisthemisia	2
Trachina	15
Wagenknechtia	5
Xanthemisia	4
Xerocentris	8
Epicharis	
Anepicharis	3
Cyphepicharis	1
Epicharana	6
Epicharis s. str.	3
Epicharitides	7
Epicharoides	4
Hoplepicharis	4
Parepicharis	2
Triepicharis	2
Tribe Rhathymini Lepeletier (115)	
Nanorhathymus	2
Rhathymus	8
Tribe Ericrocidini Cockerell & Atkins (116)	
Acanthopus	2
Aglaomelissa	1
Ctenioschelus	2
Epiclopus	3
Ericrocis	2
Hopliphora	7
Mesocheira	1
Mesonychium	12
Mesoplia	
Eumelissa	5
Mesoplia s. str.	18
Tribe Melectini Westwood (117)	

(*continues*)

Table 16-1. The Bee Taxa *(continued)*

Subfamily Apinae *(continued)*	
Afromelecta	
Acanthomelecta	1
Afromelecta s. str.	2
Brachymelecta	1
Melecta	
Eupavlovskia	2
Melecta s. str.	48
Melectomimus	1
Paracrocisa	3
Pseudomelecta	5
Sinomelecta	1
Tetralonioidella	10
Thyreomelecta	7
Thyreus	123
Xeromelecta	
Melectomorpha	2
Nesomelecta	3
Xeromelecta s. str.	1
Zacosmia	1
Tribe Euglossini Latreille (118)	
Aglae	1
Eufriesea	52
Euglossa	103
Eulaema	25
Exaerete	6
Tribe Bombini Latreille (119)	
Bombus	
Alpigenobombus	6
Alpinobombus	5
Bombias	2
Bombus s. str.	10
Brachycephalobombus	2
Coccineobombus	2
Confusibombus	1
Crotchiibombus	1
Cullumanobombus	4
Dasybombus	2
Diversobombus	4
Eversmannibombus	1
Exilobombus	1
Fervidobombus	20
Festivobombus	1
Fraternobombus	1
Funebribombus	2
Kallobombus	1
Laesobombus	1
Megabombus	14
Melanobombus	14
Mendacibombus	12
Mucidobombus	1
Orientalibombus	3
Pressibombus	1
Psithyrus	29
Pyrobombus	43
Rhodobombus	3
Robustobombus	5
Rubicundobombus	1
Rufipedibombus	2
Senexibombus	4
Separatobombus	2
Sibericobombus	7
Subterraneobombus	9
Thoracobombus	19
Tricornibombus	3
Tribe Meliponini Lepeletier (120)	
Austroplebeia	9
Cephalotrigona	3
Cleptotrigona	2
Dactylurina	2
Hypotrigona	6
Lestrimelitta	8
Liotrigona	8
Lisotrigona	3
Melipona	40
Meliponula	
Axestotrigona	12
Meliplebeia	12
Meliponula s. str.	1
Meliwillea	1
Nannotrigona	9
Nogueirapis	3
Oxytrigona	8
Paratrigona	28
Pariotrigona	1
Paratrigonoides	1
Partamona	
Parapartamona	7
Partamona s. str.	34
Plebeia	
Plebeia s. str.	30
Scaura	4
Schwarziana	2
Plebeina	1
Scaptotrigona	24
Trichotrigona	1
Trigona	
Duckeola	2
Frieseomelitta	10
Geotrigona	16
Heterotrigona	37
Homotrigona	1
Lepidotrigona	4
Papuatrigona	1
Tetragona	17
Tetragonisca	30
Trigona s. str.	30
Trigonisca	23
Tribe Apini Latreille (121)	
Apis	11

Total genera	443
Total genera and subgenera	1,234[a]
Total described species placed as to genus and subgenus	17,533[b]

[a]This is the total number of genus-group taxa that are not subdivided in this classification. The number was obtained by counting all genera and subgenera, except that, for genera in which subgenera are recognized, the typical subgenera (labeled s. str.) were not counted.

[b]See Section 16 and the legend for this table for explanations of the criteria for counting species included in this total.