WORLD CATALOG OF SPHAEROCERIDAE (DIPTERA)

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World catalog of Sphaeroceridae (Diptera)

Abstract. The first world catalog of Sphaeroceridae (lesser dung flies) includes all taxa described in the family during 1800-2000. Altogether 1,344 valid species-group taxa and 124 genus-group taxa are recorded along with all synonyms and published generic and subgeneric combinations. In addition, nomina nuda and doubtful genera and species are listed. A number of new nomenclatural changes are proposed (one new name; one new suprageneric, five generic and 29 specific synonyms; 150 new combinations; three species restituted from synonymy; two subspecific taxa elevated to specific status). One neotype and 26 lectotypes are designated. Taxa excluded from Sphaeroceridae are reviewed in detail. A history of taxonomic research on the family is outlined and its systematic position and classification summarized. A total of 26 illustrations are provided, depicting characteristic representatives of the different subgroups of Sphaeroceridae. A world bibliography of Sphaeroceridae, with a total of 1,386 references, is given.

Keywords. Sphaeroceridae, catalog, nomenclature, taxonomy, bibliography

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Contents

Introduction

The Sphaeroceridae, also known as lesser dung flies, are among the most common insects associated with decaying organic materials. Although they are often unnoticed due to their small size and generally drab appearance, members of this species-rich family of acalyptrate Diptera occur in almost all terrestrial habitats throughout the world. Although the Sphaeroceridae is generally considered a well-defined monophyletic group compared with many other acalyptrate fly families, it exhibits considerable morphological diversity in all parts of the body, including the wing venation and postabdominal structures. This species richness and structural diversity plausibly evolved as a consequence of the extreme adaptibility of the group to colonize various habitat-niches where the species act as typical decomposers. Despite the fact that the larvae of probably all species of Sphaeroceridae are saprophagous (more precisely: they are microbial grazers), members of the family inhabit an unexpectedly wide range of habitats utilizing almost every available type of rotting organic substrate of plant, fungal and animal origin. The common English name for Sphaeroceridae indicates the association of many species with dung, but actually only a limited number are true coprophages; some species are necrophagous or develop in rotting fungi, but probably the largest number of species are associated with decaying vegetation. The family contains many typical habitat-tolerant (r-strategy type) species which can develop in various rotting substances; many of them have colonized large areas of the world, their spread often aided by human activities. On the other hand, many sphaerocerids are highly specialized taxa living under extreme conditions in peculiar habitats (e.g., in deep layers of plant detritus, in burrows and nests of vertebrates or social insects, in caves, in burried dung and carrion, in tunnels made by small beetles living in dung, in dung of invertebrates, in decayed seaweed, in high mountains and cold subantarctic islands, etc.). Sphaeroceridae are occasionally nuisance pests around slaughterhouses or waste treatment plants, and a few species have been suspected to spread germ organisms, but in general they are not economically important. Most species are beneficial because they speed up the process of decay and nutrient recycling.

Adult Sphaeroceridae are small (0.7-5.5 mm. long), robust, usually dull colored flies. They are relatively easy to recognize from other acalyptrate flies by their short, thick first tarsomere of the hindleg. See Marshall & Richards (1987) or Roháček (1998a) for more extensive diagnoses.

This catalog documents our current knowledge of the biodiversity of the Sphaeroceridae. It includes 1,339 valid species and 5 subspecies in 111 genera and 13 subgenera. Although extensive taxonomic effort, much of it in the past 30 years, has uncovered great species richness in this family, the taxa cataloged here probably represent only a small portion of the actual fauna of the group, particularly in tropical areas. We know of hundreds of unnamed species that still await description in collections, not to mention further thousands that probaby occur in various unexplored areas of the world.

Catalogs are considered valuable tools that enable their users to find the most basic information on a taxon, including its currently used (valid) name and bibliographic references to sources of further detailed data. In this way, catalogs are indispensable for taxonomic studies but also stimulate other fields of research.

Sphaeroceridae were previously cataloged within regional catalogs of the order Diptera as a whole; members of the family were included even in the early catalogs, e.g., by Schiner (1864b) on European, Aldrich (1905) on Nearctic, and Becker (1905) on Palaearctic Diptera. The Sphaeroceridae were also treated in the more recent catalogs of the major biogeographic regions (for references see below) that together covered almost the entire world fly fauna. However, most of these catalogs are now much outdated because of huge changes in sphaerocerid nomeclature and classification and especially due to the numerous taxa discovered and described subsequently.

On the occasion of the First International Congress of Dipterology in Budapest in 1986, the senior authors of this publication agreed to catalog the world fauna of Sphaeroceridae. Interestingly, the starting point was not the Palaearctic catalog (Papp, 1984) published shortly before the Congress, but a checklist of Holarctic Limosininae presented at the Congress by Roháček & Marshall (1986b). It was the first cataloging effort to incorporate the newly proposed classification of the subfamily. Data for the catalog were then accumulated in a database held at the Department of Environmental Biology, University of Guelph, Canada. However, in the past fifteen years, the majority of our research effort was mainly devoted to taxonomic studies of the most problematic groups of Sphaeroceridae because the catalog could not be finished meaningfully without resolution of numerous nomenclatural and taxonomic problems. In the years 1997-2001, when the preparation and publication of the catalog was supported by three grants (see Acknowledgements), all the data stored in the Guelph database were converted into a text file, rechecked, and extensively supplemented with omitted taxa and data. Although the previous regional catalogs formed the basis for initial database entries, numerous new taxa have been added and all of the previous records were greatly extended to include detailed information on type specimens, distributions, and references, all on the basis of original literature. The classification adopted here also differs markedly from those used in regional catalogs, with exception of that on Australasian/Oceanian Diptera (Marshall, 1989b). All available taxa of Sphaeroceridae described prior to 2001 are treated in the catalog; three papers published in the beginning of 2001 (Marshall, 2001; Munari, 2001; Roháček, 2001) were also included because of important nomenclatural and taxonomic changes.

In addition to the monographic works and taxonomic studies cited in relevant places of the catalog, the following most recent and most important sources have been used for the compilation of distributional data:

Catalogs: Richards (1965c - Nearctic), Richards (1967b - Neotropical), Hackman (1977 - Oriental), Richards (1980 - Afrotropical), Papp (1984 - Palaearctic), Marshall (1989b - Australasian/Oceanian), N. L. Evenhuis (1994 - fossil flies, World).

Checklists: Except for checklists by Robinson (1984 - Falkland Is.), N. L. Evenhuis (1985 - Niue I.), Poole & Gentili (1996 - Nearctic Region) and Lin & Chen (1999 -

Taiwan) all others [including unpublished lists, see below] are from the Palaearctic Region: Steyskal & El-Bialy (1967 - Egypt), Hackman (1980 - Finland), Hirashima (1989 - Japan), Gosseries et al. (1991 - Belgium), Nowakowski (1991 - Poland), Munari (1995 - Italy), Roháček (1997 - Czech Republic & Slovakia), Papp (1998 - Switzerland), Roháček (1998b - Great Britain & Ireland), Roháček & Buck (1999 - Germany), Pakalniškis et al. (2000 - Lithuania). Moreover, the checklists in preparation for the following countries were also available through the generous kindness of the authors: Spain, incl. Balearic and Canary Is., Portugal, incl. Azores and Madeira, Andorra (Carles-Tolrá, in litt.); Netherlands (Beuk & Roháček, in litt.), Denmark (Meier & Roháček, in litt.), Hungary (Papp, in litt.).

Faunal treatments: *Afrotropical*: Hackman (1958b - Cape Verde Is.), Richards (1959 - Ethiopia), Hackman (1965a - South Africa), Hackman (1967b - Madagascar), Vanschuytbroeck (1970 - Congo), Papp (1990c - Afrotropical Region); *Australasian/ Oceanian:* Malloch (1934 - Samoa), Harrison (1959, 1976 - New Zealand), Richards (1963a - Micronesia), Tenorio (1968 - Hawaii), Tenorio & Tenorio (1980 - Hawaii), Mathis (1989 - Pitcairn group Is.), Hayashi (1992a - Australian region); *Nearctic:* Marshall & Brown (1984 - Canada), Marshall & Wheeler (1991 - Canada: Queen Charlotte Is.), Marshall (1994, 1997d - Canada); *Neotropical*: Malloch (1914a - Costa Rica), Richards (1931, 1961a - south Chile), Richards (1963d - Central and South America), Richards (1967c - Galápagos Is.), Woodley & Hilburn (1994 - Bermuda), Marshall (1997c - Juan Fernández Is.); *Oriental:* Deeming (1969 - Nepal), Papp (1988b, 1991b - Oriental Region), Hayashi (1989a - Taiwan, Hong Kong), Hayashi (1989c, 1991c - Pakistan); *Palaearctic*: Séguy (1934 - France), Nielsen et al. (1954 - Iceland), Coe (1962a,b - the former Yugoslavia), Vanschuytbroeck (1962a - Greece), Séguy (1963 - the former Yugoslavia), Lyneborg (1965 - Denmark), Andersson (1967 - Iceland), Lyneborg (1968 - Faeroe Is.), Nartshuk (1970a, 1988 - European part of the former Soviet Union), Hackman (1972 - Estonia, Latvia), Papp (1973a - Mongolia), Papp (1973b - Spain: Balearic Is., Finland), Papp (1974d - Central Asia), Papp (1977b, 1982a - Canary Is.), Papp (1977d, 1978c - Tunisia), Papp (1978a - Afghanistan), Papp (1979c - the former Soviet Union), Papp (1979d - Russia: Karelia), Troger & Roháček (1980 - Austria), Ursu (1982, 1987, 1992 - Roumania), Nishijima & Yamazaki (1984, Japan), Hayashi (1986b, 1995a - Japan), Kuznetzova (1986a, 1987a,c, 1988 - Latvia), Ozerov (1986 - Far East), Tsankova (1987 - Bulgaria), Papp & Roháček (1988 - Israel), Pitkin (1988 - Great Britain), Florén (1989 - Sweden, Norway), Franz (1989 - Austria), Kuznetzova (1989a - the former Soviet Union), Roháček (1989, 1991a, 1992b, 1994a - Czech Republic & Slovakia), Carles-Tolrá (1990a,b - Spain), Munari & Roháček (1990 - Italy: Sardinia), Papp (1990b - Hungary), Mohamed (1991 - Egypt), Kuznetova (1992b - Far East), Kuznetzova (1993a, 1994a, 1995, 1997 - Russia: Siberia), Kuznetzova & Kozánek (1993 - North Korea), Munari (1993b - North Africa, Middle East), Roháček (1994b - Slovakia), Marshall & Sun (1995 - China), Munari (1995b - Spain, Portugal), Roháček (1996 - Czech Republic), Hayashi & Tuno (1998 - Japan), Munari (1998 - Italy), Gatt (2000 - Malta) and unpublished faunal treatments dealing with Norway (Florén & Roháček, in litt.) and Canary Is. (Roháček, Báez & Buck, in litt.) were also used with permission of authors; *South Atlantic:* Frey (1954 - Tristan da Cunha), Vanschuytbroeck (1977 - Saint Helena) and unpublished records from Gough

I. (Jones, in litt.) were also used with permission of author; *Subantarctic:* Womersley (1937 - subantarctic islands), Séguy (1954a - Kerguelen Is.), Papp (1982d - Crozet Is.).

Numerous additional unpublished distributional data were supplied by all authors of the catalog, based on their own databases, files and/or collections. Thus, the catalog also contains original distribution data besides those exhausted from literary sources.

The authors of this catalog contributed to its preparation in various ways and extent. Tucminae were cataloged by S. A. Marshall, and Homalomitrinae by J. Roháček. Copromyzinae were treated mainly by A. L. Norrbom, with data added by J. Roháček (for Palaearctic taxa in particular) and S. A. Marshall (for some New World taxa). Sphaerocerinae were cataloged by J. Roháček with extensive revisions by Dora I. Quiros and S. A. Marshall (particularly for the New World taxa). The largest subfamily Limosininae was initially cataloged by J. Roháček (Old World and Australasian taxa) and S. A. Marshall (New World taxa) and then supplemented and corrected by M. Buck who also is responsible for the genus *Leptocera*; I. Smith and S. A. Marshall prepared the section dealing with the genus *Pterogramma*. J. Roháček and M. Buck reviewed all entries of the catalog and prepared the bibliography, the latter with additions and corrections of all co-authors. The sections dealing with generically unplaced and doubtful species and with unavailable names and the chapter on taxa excluded from the Sphaeroceridae were made by J. Roháček. All co-authors contributed to the chapter "New nomenclatural changes" where the section on designation of primary types was mainly completed by A. L. Norrbom. J. Roháček edited the complete manuscript and prepared all original illustrations and the general index of taxa.

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History of taxonomic research on Sphaeroceridae

The history of taxonomic research in the family Sphaeroceridae is very complicated and difficult to describe. The brief outline presented below attempts only to summarize the most important points in the history of the systematics of this group for better understanding of taxonomic context and progress in development of its classification.

The first valid taxon described in the family was the genus *Sphaerocera* Latreille, 1804 with its type species, *S. curvipes*, described a year later (Latreille, 1805). However, sphaerocerids (lesser dung flies) were apparently known to dipterists working even earlier in the 19th century. The genera *Cypsela* Meigen, 1800 and *Borborus* Meigen, 1803 were surely both based on species of Sphaeroceridae, but both these names were suppressed by ICZN (1963, 1997) because misinterpretation of their type species had caused much confusion. The type species of both *Cypsela* and *Borborus* was (by subsequent designations) a species misidentified as *Musca subsultans* Linnaeus, 1767, but actually identical with *Sphaerocera curvipes* Latreille, 1805. The true *Musca subsultans* Linnaeus belongs to the genus *Borophaga* Enderlein, 1924 (Phoridae) (see Brown & Sabrosky 1994). The specific name *subsultans* clearly was used by early dipterists such as Fallén (1820), Meigen (1830), Macquart (1835), and Haliday (1836) for the species now known as *Sphaerocera curvipes*. The second valid taxon of Sphaeroceridae was the genus *Copromyza* Fallén, 1810 also established without inclusion of any species. Its type species, *Copromyza equina*, was described ten years later (Fallén, 1820). *Leptocera* Olivier, 1813, erected as a monotypic genus for *L. nigra* Olivier, 1813, is the third oldest valid genus of the family. However, Olivier's (1813) paper was overlooked by subsequent entomologists until Mik (1888) rediscovered it and synonymized *Leptocera* with *Limosina* Macquart, 1835. The above three genera are mentioned here in some detail chiefly because they interestingly each represent a different subfamily of Sphaeroceridae.

The initial period of taxonomic research on Sphaeroceridae continued through the 19th century. Fallén (1820, 1826) was the first to describe more species of Sphaeroceridae, all in his own genus *Copromyza* Fallén, 1810. Similarly, Meigen (1830) placed a number of species he discovered in his genus *Borborus* Meigen, 1803, although these species (like those of Fallén) are now members of a number of genera belonging to

three different subfamilies. Fallén (1920) also placed in *Copromyza* a species of the family Coelopidae. Robineau-Desvoidy (1830) developed a very original suprageneric classification, partly based on habitats of larvae and adults, and was the first to describe more genera, most of which are now unfortunately unrecognizable as are the majority of his species now classified (some with much doubt) in the Sphaeroceridae. The suprageneric name Putrellidae of Robineau-Desvoidy (1830) is an informal name unavailable for subsequent use. On the other hand, Macquart (1835) introduced the first valid family-group name, viz. the "tribe" Sphaeroceridae and divided the species of his tribe into 8 (5 new) genera. The subsequent paper by Haliday (1836) was another "first" in the research on Sphaeroceridae - it was the first taxonomic study solely devoted to Sphaeroceridae (with no species belonging to other families included !). It is also distinguished by unusually accurate descriptions for this time, which enabled subsequent students to recognize most of his taxa, and also by an attempt to place genera of Robineau-Desvoidy (1830) in Macquart's (1835) system of genera. After Haliday (1836) further important contributions to the taxonomy of Sphaeroceridae are those of Zetterstedt (1847, 1852, 1855, 1860) and, particularly, the monograph by Stenhammar (1855), despite the fact that he used a very broad concept of the group (named by him Copromyzinae) with inclusion of genera now belonging to the unrelated families Coelopidae and Sepsidae (*Orygma*).

In the second half of the 19th century, further splitting of the Sphaeroceridae into additional genera was proposed. Lioy's (1864) treatment of the Sphaeroceridae used a restricted concept of the group again agreeing with the present-day limits of the family. It contains a number of newly established genera which were not subsequently used because the work fell into oblivion. The rather poor compilation of the group for the Fauna Austriaca by Schiner (1864a) unfortunately had a great influence on research on the Sphaeroceridae of Central Europe and caused great confusion and many misidentifications in the second half of the 19th century and even later. Rondani (1880) reviewed the Sphaeroceridae (as Copromyzinae) of Italy and established two additional genera and described several species; for unknown reasons he also included the genus *Thyreophora* which now belongs to Piophilidae. Rondani (1880) apparently did not know the work of Lioy (1864) at all.

The first extra-European taxa of Sphaeroceridae also were described during the 19th century. The pioneer works in this field are those of Wiedemann (1830), Macquart (1844, 1846), F. Walker (1849, 1860, 1861, 1865), Blanchard (1852), Rondani (1868), Thomson (1869), Eaton (1875a,b), and Bigot (1888). They mostly deal with fauna of tropical areas but also of subantarctic islands (Eaton 1875a,b) and most describe single or just a few species of Sphaeroceridae. Walker (1849) was the first to describe a Nearctic species of Sphaeroceridae, *Borborus annulus* (now *Crumomyia annulus*), and North American Sphaeroceridae were first listed in a catalog by Osten-Sacken (1858, 1878). The first endemic Nearctic species, *Aptilotus politus*, was described only by Williston (1893, as *Apterina polita*).

The first stage of taxonomic research on Sphaeroceridae terminated in the beginning of 20th century. The catalogs published that time, viz. Palaearctic by Becker (1905) and Nearctic by Aldrich (1905), are typical examples of the classification of

sphaerocerid species used towards the end of this period. The species were grouped under a few genera of very broad concept, such as *Borborus* auct. (= *Copromyza*), *Sphaerocera* or *Limosina*, which were nearly equivalent to the current subfamilies Copromyzinae, Sphaerocerinae and Limosininae. On the contrary, several small, often monotypic, genera were also recognized, most of which were aberrant taxa distiguished by striking modification (e.g., by aptery and brachyptery) and even some now belonging to other families. The begining of the 20th century saw increased investigation of the Sphaeroceridae of extra-Holarctic regions, cf. studies by Adams (1905), Bezzi (1908a), Becker (1910a,b, 1922), Collin (1912), Villeneuve (1916) and Schmitz (1917c) on the Afrotropical fauna; by de Meijere (1908, 1914, 1916a, 1918), Collin (1910a) and Brunetti (1913, 1924) on the Oriental fauna; by C. W. Johnson (1908, 1913, 1915), Malloch (1912, 1914a,b, 1925a), Knab & Malloch (1912b) and Becker (1920) on the Neotropical fauna; and Knab & Malloch (1912a) on the Australian fauna.

The second stage of research on the taxonomy of Sphaeroceridae was started by Duda (1918, 1920a,b, 1921, 1923, 1924a-c, 1925, 1938), who published the first comprehensive revisions and monographs for the family. Although Duda did not know some old works, did not accept some valid names, and made numerous nomenclatural mistakes, he was the first to propose taxonomically well-grounded divisions of the large genera *Borborus*, *Sphaerocera* and *Limosina* (as *Leptocera* in some studies) into a number of subgenera. He also proposed several peculiar exotic genera in addition. This systematic concept was followed by Richards (1930), who rectified most of Duda's nomenclatural shortcomings on the basis of his comprehensive survey of world genus-group taxa. He used a classification system with the large genera *Copromyza*, *Sphaerocera* and *Leptocera* in all his subsequent works (up to Richards, 1980), adding to them further subgenera and describing numerous additional aberrant genera (often based on flightless species) from all over the world. Up to the seventies this Duda-Richards concept was followed with some minor modifications by almost all dipterists studying Sphaeroceridae, e.g., by Spuler (1924a-d, 1925a-c), who reviewed North American Sphaeroceridae, by Vanschuytbroeck (1942, 1943a,b, 1945, 1948, 1950a,b, 1951a, 1959a,b, 1962b), who mainly worked on the African fauna, by Hackman (1965b, 1967a,b), Deeming (1964a,b, 1966a, 1969), Tenorio (1967, 1968), and Harrison (1976). The regional catalogs of the Nearctic, Neotropical and Afrotropical Regions were prepared following this concept (Richards 1965c, 1967b, 1980). However, after 1950 papers appeared in which some subgeneric taxa were given generic status (e.g., Vanschuytbroeck, 1951b,c, 1962a; Hackman, 1958a,b, 1960, 1961, 1965a). These papers were forerunners of the current classification of Sphaeroceridae.

The third and current stage of taxonomic research on Sphaeroceridae was intiated by Hackman's (1969a) review of the classification and zoogeography of the family where he elevated a number of former subgenera of *Leptocera* and *Sphaerocera* (here following Kim, 1968) to generic rank. Simultaneously, Kim (1968, 1972b) started a revision of world Sphaerocerinae and both these authors begin to use genitalic characters for supraspecific classification. This trend was followed by Papp (since 1971) and Roháček (since 1975). Hackman (1977) used his system in the catalog of Oriental

Region, and Papp (1984) followed it with some modification in the catalog of the Palaearctic Region.

Further huge changes in the classification of Limosininae were started by the monograph of the previous genus *Limosina* (published by Roháček, 1982c, 1983e,f, 1985a) with division of this heterogenous polyphyletic assemblage into a number of genera and subgenera on the basis of cladistic analysis of their relationships. The same approach was used by Norrbom & Kim (1984, 1985a,b) to re-classify the genera and subgenera of Copromyzinae. The above studies, together with works by Marshall (1982a,b, 1983a-c, 1985a-c, 1986), Roháček & Marshall (1982, 1986), and Marshall & Roháček (1984), initiated a period of very intensive taxonomic and phylogenetic research on all subfamilies of Sphaeroceridae in all biogeographical regions, which resulted in the discovery of several hundreds new species, description of a number of new genera, and recognition of two new subfamilies. These basic taxonomic revisions stimulated further students to devote their research to Sphaeroceridae. Most productive workers of recent years (1980-2000) include Marshall, Papp, Roháček, Norrbom Wheeler, Han, Kim, Hayashi, Munari, Carles-Tolrá, Kuznetzova and others.

Notes on the development of the suprageneric classification of Sphaeroceridae. In publications of early dipterists, Sphaeroceridae were not recognized as a separate suprageneric taxon and were placed under various other groups. Macquart (1835) was the first to establish for them the "tribe" Sphaeroceridae, a name used also by Haliday (1836). Newman (1834) used the unavailable name Borborites which was used by many subsequent authors as Borboridae. Stenhammar (1855) established for the same group (but in slightly broader concept) the name Copromyzinae, and Hendel (1910b) introduced for it another unavailable name Cypselinae. The family was not further subdivided until Frey (1921) recognized two subfamilies, Borborinae and Limosininae. Hendel (1928) similarly recognized in his family Cypselidae (= Sphaeroceridae) two subfamilies named Leptocerinae and Cypselinae, and he later (Hendel, 1931) added to them a third subfamily Cypselosominae [now known as the unrelated family Cypselosomatidae]. Consequently, the present-day subfamilies Sphaerocerinae and Copromyzinae long remained combined in a single subfamily named as Sphaerocerinae, Cypselinae, Borborinae or Copromyzinae (lastly by Hening, 1973). Sphaerocerinae in the contemporary restricted concept was first used by Kim (1968), and Copromyzinae was first treated as a subfamily separate from Sphaerocerinae only by Hackman (1969a).

Vanschuytbroeck (1959a) included the genus *Ceroptera* in the subfamily Ceropterinae, a name also used by Papp (1977c), Roháček (1983e), and Papp (1984), but this subfamily is no longer recognized and is placed as synonym under Limosininae. Vanschuytbroeck (1962a) also established a tribe Coprophilini which is an available name, but it has not been used subsequently because Limosininae are not classified into tribes. In the Copromyzinae two tribes were proposed by Norrbom & Kim (1985a), viz. Archiborborini and Copromyzini, the latter of which was used several times (e.g., by

Norrbom & Marshall, 1988 and Marshall & Norrbom, 1993). They are also not used in this catalog owing to incomplete solution of the tribal classification of the subfamily.

Two new subfamilies were established only recently, both based on Neotropical taxa of Sphaeroceridae. Tucminae (Marshall, 1996) was proposed as the sister-group of the rest of the family, and Homalomitrinae Roháček & Marshall (1998a) is probably closest to Limosininae.

Systematic position and classification of Sphaeroceridae

Systematic position within acalyptrate families. Hypotheses of the relationship of the family Sphaeroceridae among other acalyptrate families have greatly varied, even during past 50 years. Hennig (1958) placed the family in the superfamily Milichioidea but later (Hennig, 1971) he rejected this idea on the basis of Speight's (1969) study that suggested closer association of Sphaeroceridae with Heleomyzidae, Trixoscelididae or Anthomyzidae. Griffiths (1972) conducted a cladistic analysis of the families of Cyclorrhapha based largely upon male genitalic characters and grouped the Sphaeroceridae in the "Prefamily Anthomyzoinea" along with the above three families and six others. He considered Borboropsidae, Chyromyidae and/or Aulacigastridae, to be the group most closely related to Sphaeroceridae. This arrangement was generally followed by Steyskal (1974) who only elevated the rank of Anthomyzoinea to the superfamily Anthomyzoidea. Rohdendorf (1977) included Sphaeroceridae in the superfamily Helomyzoidea which is in his concept an heterogenous assemblage of families belonging both to Anthomyzoinea and Sciomyzoinea sensu Griffiths (1972). His clasification was not well supported and has not been accepted by any subsequent authors.

Further analysis of the systematic position of Sphaeroceridae was made by J. F. McAlpine (1989), who grouped the Sphaeroceridae together with Heleomyzidae (sensu D. K. McAlpine, 1985, i.e., including Trixoscelididae and Rhinotoridae), Chyromyidae and, tentatively, Mormotomyiidae in the superfamily Sphaeroceroidea (= Heleomyzoidea auctt.). Although this group is rather poorly supported [only one synapomorphy, the enlarged and complex distiphallus, is given by J. F. McAlpine l.c.], the placement of Sphaeroceridae near these families is substantiated because besides the above named character there are several other features shared by Sphaeroceridae, Chyromyidae and certain tribes of Heleomyzidae (e.g. Borboropsini, Trixoscelidini in sense of D. K. McAlpine, 1985; both treated as families by Papp, 1998a). Also D. K. McAlpine expressed the opinion that Chyromyidae and Sphaeroceridae are closely related to (if not merely tribes of) Heleomyzidae in his broad concept. J. F. McAlpine (1989) suggested Chyromyidae as the putative sister-group of Sphaeroceridae, but more probably the sister-groups of both these families will be found among different tribes of the (paraphyletic) family Heleomyzidae (as defined by D. K. McAlpine 1985) when their postabdominal structures are better known (cf. Roháček, 1998). The subfamilies Copromyzinae and the aberrant Tucminae retain a number of plesiomorphic features

and undoubtedly most closely resemble Heleomyzidae; the enigmatic genus *Pycnopota* Bezzi, 1927, even appears to be similar to Helomyzidae in having spinose costa (a character otherwise unknown in Sphaeroceridae). In conclusion, there is a general agreement that Sphaeroceridae should be grouped with Heleomyzidae, Trixoscelididae, Borboropsidae, Rhinotoridae (if the latter three are not included in the Heleomyzidae) and Chyromyidae under the superfamily Sphaeroceroidea Macquart, 1835.

Higher classification of Sphaeroceridae. The historical development of the supra-generic classification of the Sphaeroceridae was briefly outlined in the above chapter. Despite considerable recent effort to develop a phylogenetically substantiated classification the results are hitherto insufficient to split the subfamilies into tribes. Five subfamilies have been recognized; the two recently established, viz. Tucminae Marshall, 1996 and Homalomitrinae Roháček & Marshall, 1998 include some peculiar Neotropical genera whose position had to be solved because they could not be included in any of the other three subfamilies (Copromyzinae, Sphaerocerinae, Limosininae). In Copromyzinae two tribes were recognized by Norrbom & Kim (1985a), viz. Archiborborini and Copromyzini, but they are not used in this catalog merely because there are a few remaining genera unplaced to either of them. Sphaerocerinae appears to be a homogeneous group whose division into tribes is unnecessary. Relationships among some of the subfamilies are not fully resolved, but the greatest and most complex problem remaining in sphaerocerid higher classification is the tribal classification of the genera of Limosininae. This by far the largest subfamily displays extreme morphological heterogeneity and diversity so that it is difficult to study the relationships of the genera on a world basis. Cladistic analyses are moreover complicated by numerous homoplasies and by the absence of important characters (e.g., in wing venation and chaetotaxy) in apterous and brachypterous taxa caused by their adaptation to a terricolous way of life. The classification of Limosininae into tribes is therefore not expected in the very near future.

Format of the catalog, bibliography and index

General. All included names, both valid and invalid, are provided with the authorship, year, and page of the relevant publication, which is quoted in full in the bibliography. Family-group names are furnished with the full name of the type genus and annotated references to all important works that deal with the group. For all genus-group names the gender, type species, kind of designation, and annotated references are given. The species entries contain the valid name (full combination), distribution, original combination, annotation [in brackets] on sex described, illustrations, and further information available, followed by details on type locality, type, sex, depository, and other notes on primary types. Synonyms, homonyms, and other invalid names are treated under the entry of the valid name with the authorship and type information as for the valid names. Under the species entries all previously and currently recognized generic and subgeneric combinations are listed and other nomenclatural changes are noted, with references to author, year and page and annotations in brackets.

Nomenclatural and taxonomical changes. During preparation of the catalog and the examination of primary types, the authors discovered a number of new nomenclatural changes that were needed, including new names, synonyms, homonyms, generic combinations, and other changes in status. All these new changes are indicated in the catalog proper, and also are listed in the chapter "New nomenclatural changes" (see pp. 21-29), always with indication of the author who proposed them. Detailed information on primary types is also provided here for any names for which lectotypes or neotypes are designated in this catalog. The rules of the 4th edition of the International Code of Zoological Nomenclature (ICZN 1999) are strictly followed.

Family-groups names. Sphaeroceridae are classified into five subfamilies; no consistent system of tribes has hitherto been proposed. Therefore the few tribal names proposed in the family are only listed but not used in the catalog. All synonyms of family-group names are given but the very numerous misspellings are not completely included - Sabrosky (1999) should be consulted for details in this field. References to taxonomically important studies on the family and/or subfamilies are given, including those where the family-group names are not explicitly used (see under paragraph "Further references"). Explanatory notes are provided for problematic family-group taxa. In the catalog the subfamilies are arranged systematically in the following sequence: Tucminae, Copromyzinae, Sphaerocerinae, Homalomitrinae, Limosininae.

Genus-group names. After the name, author, year and page of publication, the gender is cited in parentheses. The type species is given in original combination. Synonyms, including nomina nuda (if recognized), are listed and annotated references [annotations in brackets] to taxonomically or otherwise significant studies are given, Additional notes are provided as appropriate. Valid genera and subgenera are arranged alphabetically within the respective subfamily (genera) or genus (subgenera).

Species-group names. A valid species-group name is first printed in complete binomen (or trinomen) in boldface type, with author and year in normal type, sometimes followed by the abbreviation of new nomenclatural change (e.g., nom.n., stat.n., comb.n., sp.restit.) in bold.

This is followed by information about the geographic distribution, introduced with abbreviation "Distr." in bold. The country records are listed alphabetically within major biogeographic regions, which are also arranged alphabetically. Boundaries between biogeographic regions are simplified for some countries, e.g., all states of Mexico are treated under the Neotropical Region and all of Japan is included under the Palaearctic Region. Chinese provinces lying on the boundary between the Palaearctic and Oriental Regions are treated under the region to which the larger extent of their area belongs. Islands belonging to mainland countries are listed in three different ways. Those situated far from their home countries are listed separately with the country name in parentheses, e.g., "Azores (Portugal)"; those situated close to the mainland are mentioned either as "Italy (Sardinia)", which means that the species was only recorded from Sardinia, or as "Italy (incl. Sardinia)", which means that there are records both from Sardinia and the Italian mainland. The Russian Federation is divided into the same regions as used in the Palaearctic catalog (Papp, 1984), see abbreviations below. State or provincial information is provided for Australia, China, Mexico, Russia,

Canada and United States of America, in abbreviated form in parentheses after the country name (see pp. 19-21 for list of abbreviations). States of India are listed un-abbreviated.

In the next section of a species entry the original combination of the species is given, then its authorship, followed by an annotation [in brackets] indicating the sex, illustrations, and further information available in the original description. Next is information on type specimen(s), beginning with type locality, which is as detailed as available and refers to type locality of holotype, neotype or lectotype ; for syntypes all type localities recorded in the original description are given. This is followed by an abbreviation for the kind of primary type (HT = holotype, LT = lectotype, NT = neotype, ST = syntype), the citation of lectotype or neotype designations, if appropriate, the sex of type(s) and the depository abbreviated as an acronym (see pp. 17-19 for list of acronyms]. Where neotypes or lectotypes are designated in the catalog (cf. chapter „New nomenclatural changes“) a reference to the relevant page with the designation is given.

For all synonyms information including original combination, authorship and type data are given as for valid species-group taxa. New synonyms are marked with the abbreviation “syn.n.” in bold at the end of the synonym entry. All subsequent generic and subgeneric combinations and misspellings with their authorships are also provided in chronological order. These names are followed by a period and hypen ". -" before the author name, whereas there is no punctuation following an original combination. Nomina nuda are listed at the end of a species entry. For all combinations, the most important subsequent references are listed with annotations in brackets indicating their general relevance, e.g., redescriptions, synonymy or homonymy, older homonyms, preimaginal stages, phylogeny, selected data on life-history and biology, etc. Additional explanatory notes are attached if appropriate. All valid species names are arranged alphabetically within the respective genus or subgenus (if used).

Other parts of the catalog. At the end of each subfamily, the following sections can be found: (1) Generically unplaced species (species incertae sedis), (2) Doubtful genera (genera dubiae) and (3) Doubtful species (species dubiae). These taxa are provided with the same information as for other genera and species if available and usually also with notes about their probable identity and/or affiliation.

Near the end of the catalog (following Limosininae), similar sections deal with (1) Doubtful genera of Sphaeroceridae [unplaced to subfamilies] and (2) Doubtful species of Sphaeroceridae [unplaced to subfamilies]. The final parts of the catalog are two lists of unavailable generic and specific names proposed in Sphaeroceridae, which contain nomina nuda and names suppressed or rejected by the ICZN.

Bibliography. The bibliography includes all literature to our knowledge that deals at least partly with Sphaeroceridae. All references cited in the catalog proper are included as are all other works quoted in other chapters of this book (including a few on other subjects than Sphaeroceridae). However, the bibliography also contains numerous non-cited papers which were usually used as sources of data on distribution.

The bibliography is arranged alphabetically by author (first author) and then chronologically under each author. For papers published in the same year the addition of a letter beginning with „*a*“ is given. Titles of periodicals are given in full to avoid confusion of some similarly named journals.

Index. One general index of all scientific names used in Sphaeroceridae is provided. Names are ordered alphabetically. The gender of valid specific names agrees with the generic name under which the former are listed; consequently, in many cases the ending is different from that originally proposed. On the contrary, names of species which changed gender through synonymy are cited in their original orthography. Nomina nuda with the same name as the valid taxon are not included. Misspellings of both generic and specific names are listed.

Acronyms used in the catalog

1. Acronyms of museums and collections

(based, with some additions, on Arnett et al. 1993).

AMNH American Museum of Natural History, New York, New York, USA
AMSA Australian Museum, Sydney, Australia
ANIC Australian National Insect Collection, Canberra, Australia
ANSP Academy of Natural Sciences, Philadelphia, Pennsylvania, USA
BPBM Bernice P. Bishop Museum, Honolulu, Hawaii, USA
BMNH The Natural History Museum [formerly British Museum (Natural History)], London, England, U.K.
CASC Department of Entomology, California Academy of Sciences, San Francisco, California, USA
CMNC Canadian Museum of Nature, Ottawa, Ontario, Canada
CMNZ Canterbury Museum, Christchurch, New Zealand
CNCI Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada
CTB Collection of Dr. Carles-Tolrá, Barcelona, Spain
CUMZ University Museum of Zoology, Insect Collection, Cambridge, England, U.K.
DEBU Department of Environmental Biology, University of Guelph, Guelph, Ontario, Canada
DEIC Deutsches Entomologisches Institut, Eberswalde, Germany
DENH Department of Entomology, College of Life Sciences and Agriculture, University of New Hampshire, Durham, New Hampshire, USA
ENIH Reference Museum, National Institute of Health, Tokyo, Japan
ETHZ Zoologisches Museum der Universität Zürich, Zürich, Switzerland
FMNH Field Museum of Natural History, Chicago, Illinois, USA
HFM Collection of Prof. Herbert Franz, Mödling, Austria
HNHM Hungarian Natural History Museum, Budapest, Hungary
IESC Universidad Metropolitana de Ciencias de la Educación, Instituto de Entomología ”Profesor José Herrera González”, Santiago, Chile.
IEUS Istituto di Entomologia, Università degli studi di Bologna, Bologna, Italy
IMCI Indian Museum, Calcutta, India
INBC Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica

INHS	Department of Entomology, Illinois Natural History Survey, Champaign, Illinois, USA
IPBC	Istituto Policattedra di Biologia Animale, Catania, Sicily, Italy
ISNB	Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium
ITLJ	Insect Museum, National Institute of Agro-Environmental Sciences, Tsukuba, Ibaraki-ken, Japan
IZAS	Insect Collection, Institute of Zoology, Academia Sinica, Haidian, Beijing, China.
IZBE	Zoologia ja Botanika Instituut, Tartu, Estonia
IZUN	Instituto di Zoologia, Universita degli Studi di Napoli, Portici, Italy
JRO	Collection of Dr. Jindřich Roháček, Opava, Czech Republic
KNPC	Kruger National Park Insect Collection, Skukuza, South Africa
KSUC	Department of Entomology, Kansas State University, Manhattan, Kansas, USA
KUEC	Department of Environmental Sciences, Kyushu University, Fukuoka, Japan
LACM	Los Angeles County Museum of Natural History, Los Angeles, California, USA
LEOU	Laboratory of Entomology, Obihiro University, Obihiro, Japan.
MCNV	Museo Civico di Storia Naturale, Venezia, Italy
MCZC	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
MEUC	Museo de Entomologia, Universidad de Chile, Santiago, Chile
MHNG	Muséum d'Histoire Naturelle, Genève, Switzerland
MHNLi	Museum d'Histoire Naturelle, Lille, France
MMBC	Moravské zemské muzeum, Brno, Czech Republic
MNHN	Entomologie, Muséum National d'Histoire Naturelle, Paris, France
MNNC	Museo Nacional de Historia Natural, Santiago, Chile.
MRAC	Musée Royal de l'Afrique centrale, Tervuren, Belgium
MSNM	Museo Civico di Storia Naturale, Milano, Italy
MVMA	National Museum of Victoria, Abbotsford, Victoria, Australia
MZCP	Museu e Laboratório Zoológico da Faculdade de Cięncias, Universidade de Coimbra, Coimbra, Portugal.
MZHF	Universitetets Zoologiska Museum, Helsinki, Finland
MZLU	Museum of Zoology, Lund University, Lund, Sweden
MZSP	Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil
MZUF	Museo Zoologico "La Specola", Firenze, Italy
NHMB	Naturhistorisches Museum, Basel, Switzerland
NHMW	Naturhistorisches Museum, Wien, Austria
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden
NMBA	Naturhistorisches Museum des Stifts Admont, Admont, Austria
NMID	National Museum of Ireland, Dublin, Ireland
NMPC	Národní muzeum, Praha, Czech Republic
NMRL	Nature Museum of the Latvian State University, Riga, Latvia
NMSA	Natal Museum, Pietermaritzburg, South Africa
NMWN	National Museum of Namibia, Windhoek, Namibia
NZAC	New Zealand Arthropod Collection, Auckland, New Zealand
OXUM	University Museum, Oxford, England, U.K.
QBUM	Museu Nacional, Rio de Janeiro, Brazil.
QMBA	Queensland Museum, South Brisbane, Australia
RMNH	Nationaal Natuurhistorische Museum, Leiden, The Netherlands
ROME	Royal Ontario Museum, Toronto, Ontario, Canada
SEMC	Snow Entomological Museum, University of Kansas, Lawrence, Kansas, USA

SMNS Staatliches Museum für Naturkunde, Stuttgart, Germany
SMOC Slezské zemské muzeum Opava, Opava, Czech Republic
SMTD Staatliches Museum für Tierkunde, Dresden, Germany
SNMC Slovenské národné múzeum, Bratislava, Slovakia
TAUI National Collection of Insects, Department of Zoology, University of Tel Aviv, Tel Aviv, Israel
ULCI Universidad de La Laguna, Departamento de Zoología, La Laguna, Tenerife, Canary Is., Spain
USNM National Museum of Natural History, Smithsonian Institution, Washington, DC, USA
UZIU Zoological Institute, Uppsala, Sweden
WSUC Washington State University, Pullman, Washington, USA
ZFMK Museum Alexander Koenig, Bonn, Germany
ZISP Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
ZMAN Instituut voor taxonomische Zoölogie, Amsterdam, The Netherlands
ZMHB Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany
ZMPA Museum of the Institute of Zoology, Polish Academy of Sciences, Warszawa
ZMUC Universitets Zoologiske Museet, København, Denmark
ZMUM Zoological Museum of the Moscow State University, Moscow, Russia

2. Abbreviations for states of the USA

AL Alabama
AK Alaska
AR Arkansas
AZ Arizona
CA California
CO Colorado
CT Connecticut
DC District of Columbia
DE Delaware
FL Florida
GA Georgia
IA Iowa
ID Idaho
IL Illinois
IN Indiana
KS Kansas
KY Kentucky
LA Louisiana
MA Massachusetts
MD Maryland
ME Maine
MI Michigan
MN Minnesota
MO Missouri
MS Mississippi
MT Montana
NC North Carolina
ND North Dakota
NE Nebraska
NH New Hampshire
NJ New Jersey
NM New Mexico
NV Nevada
NY New York
OH Ohio
OK Oklahoma
OR Oregon
PA Pennsylvania
RI Rhode Island
SC South Carolina
SD South Dakota
TN Tennessee
UT Utah
VA Virginia
VT Vermont
WA Washington
WI Wisconsin
WV West Virginia
WY Wyoming

3. Abbreviations for provinces and territories of Canada

AB	Alberta
BC	British Columbia
LB	Labrador
MB	Manitoba
NB	New Brunswick
NF	Newfoundland
NS	Nova Scotia
NT	Northwest Territories
NU	Nunavut
ON	Ontario
PE	Prince Edward Island
QC	Quebec
SK	Saskatchewan
YK	Yukon

4. Abbreviations for states of Mexico

AGC	Aguascalientes
BCN	Baja California Norte
BCS	Baja California Sur
CAM	Campeche
CHI	Chiapas
CHU	Chihuahua
COA	Coahuila
COL	Colima
DF	Distrito Federal
DUR	Durango
GUA	Guanajuato
GUE	Guerrero
HID	Hidalgo
JAL	Jalisco
MEX	México
MIC	Michoacán
MOR	Morelos
NAY	Nayarit
NUL	Nuevo León
OXA	Oaxaca
PUE	Puebla
QNR	Quintana Roo
QRE	Querétaro
SIN	Sinaloa
SLP	San Luis Potosí
SON	Sonora
TAB	Tabasco
TAM	Tamaulipas
TLA	Tlaxcala
VRC	Veracruz
YUC	Yucatán
ZAC	Zacatecas

5. Abbreviations for states and territories of Australia

ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
TAS	Tasmania
VIC	Victoria
WA	Western Australia

6. Abbreviations for territories of Russia

CET	Central European territory
ES	East Siberia
FE	Far East
NET	North European territory
SET	South European territory
WS	West Siberia

7. Abbreviations for provinces, autonomous regions and territories of China

ANH	Anhui
BEI	Beijing
CHO	Chongqing
FUJ	Fujian

GAN Gansu
GDO Guangdong
GUI Guizhou
GXI Guangxi
HAI Hainan
HEB Hebei
HEI Heilongjiang
HEN Henan
HKG Hong Kong
HUB Hubei
HUN Hunan
JIL Jilin
JSU Jiangsu
JXI Jiangxi
LIA Liaoning
MON Nei Mongol (Inner Mongolia)
NIN Ningxia
QIN Qinghai
SDO Shandong
SGH Shanghai
SIC Sichuan
SNX Shaanxi
SXI Shanxi
TIA Tianjin
TIB Xizang (Tibet)
XIN Xinjiang
YUN Yunnan
ZHE Zhejiang

New nomenclatural changes

New names

Rachispoda caudatula Roháček, **nom.n.**
for *Leptocera* (*Rachispoda*) *caudata* Roháček, 1991b: 222 [primary junior homonym of *Leptocera (Scotophilella) caudata* Duda, 1929, currently a synonym of *Sclerocoelus plumiseta* (Duda, 1925)].

New status

Lotophila nepalensis Hayashi, 1991 **stat.n.**
[*Lotophila pallida* ssp. *nepalensis* Hayashi, 1991b: 11]. - Roháček & Norrbom.
Norrbomia tropica (Duda, 1923) **stat.n.**
[*Borborus (Borborillus) sordidus* var. *tropicus* Duda, 1923: 86]. - Norrbom.

New suprageneric synonyms

LIMOSININAE Frey, 1921
CEROPTERINAE Vanschuytbroeck, 1959a: 2 **syn.n.** - Marshall & Roháček

New generic synonyms

COPROMYZINAE

Archiborborus Duda, 1921
Procopromyza Richards, 1931: 67 **syn.n.** - Roháček & Norrbom.
Dudaia Hedicke, 1923
Afroborborus Curran, 1931: 9 **syn.n.** - Norrbom.

SPHAEROCERINAE

Neosphaerocera Kim, 1972
Taigetomyia Papp, 1978d: 386 **syn.n.** - Quiros & Marshall

LIMOSININAE

Aluligera Richards, 1951

Uluguria Richards, 1965a: 440 **syn.n.** - Roháček & Marshall.

Trachyopella Duda, 1918

Minuscula Roháček & Marshall, 1986a: 46 **syn.n.** - Roháček.

New specific synonyms

COPROMYZINAE

Archiborborus nitidicollis (Becker, 1920)

Archiborborus orbitalis var. *latifrons* Duda, 1921: 143 **syn.n.** - Norrbom.

Borborillus vitripennis (Meigen, 1830)

Musca saniosa Westring 1814: 51 **syn.n.** (**nomen oblitum -** see below**)** - Norrbom.

Copromyza pilosiventris Zetterstedt, 1860: 6395 **syn.n.** - Norrbom.

Copromyza equina Fallén, 1820

Borborus nervosus Meigen, 1835: 72 **syn.n.** - Norrbom.

Borborus nervosus Meigen, 1838: 407 **syn.n.** - Norrbom.

Crumomyia glabrifrons (Meigen, 1830)

Copromyza fuscipennis Zetterstedt, 1847: 2481 **syn.n.** - Norrbom.

Norrbomia nilotica (Becker, 1903)

Borborus (Borborillus) nitidifrons Duda, 1923: 86 **syn.n.** - Norrbom.

Norrbomia tropica (Duda, 1923)

Norrbomia indica Papp, 1988a: 399 **syn.n.** - Norrbom.

SPHAEROCERINAE

Neosphaerocera flavicoxa (Malloch, 1925)

Neosphaerocera youngheae Kim, 1972b: 427 **syn.n.** - Quiros.

Parasphaerocera ecuadoria (Richards, 1965)

Sphaerocera (Parasphaerocera) shannoni Richards, 1965b: 232 **syn.n.** - Quiros.

Parasphaerocera simplex Kim, 1972

Parasphaerocera andrassyi Papp, 1978d: 376 **syn.n.** - Quiros.

Parasphaerocera tertia (Richards, 1965)

Sphaerocera (Parasphaerocera) amphora Richards, 1965b: 232 **syn.n.** - Quiros.

Sphaerocera (Parasphaerocera) musiphila Richards, 1965b: 233 **syn.n.** - Quiros.

Parasphaerocera transversalis (Richards, 1965)

Sphaerocera (Parasphaerocera) lepida Richards, 1965b: 234 **syn.n.** - Quiros.

Parasphaerocera varipes (Malloch, 1925)

Sphaerocera striata Malloch, 1925a: 122 **syn.n.** - Quiros.

Parasphaerocera xiphosternum (Richards, 1965)

Parasphaerocera medialis Kim, 1972b: 393 **syn.n.** - Quiros

Safaria forcipata Richards, 1950

Sphaerocera (Safaria) ghesquièrei Vanschuytbroeck, 1951a: 4 **syn.n.** - Quiros.

LIMOSININAE

Aluligera varicolor (Richards, 1957)

Leptocera (Limosina) pleurofasciata Richards, 1965a: 444 **syn.n.** - Marshall.

Coproica lugubris (Haliday, 1835)

Limosina (Coprophila) lugubris var. *cilicrus* Duda, 1938: 166 **syn.n.** - Roháček.

Leptocera erythrocera (Becker, 1920)

Leptocera (Paracollinella) abdominiseta Duda, 1925: 52 **syn.n.** - Buck.

Leptocera (Paracollinella) pararoralis Duda, 1925: 51 **syn.n.** - Buck & Marshall.

Leptocera fulva (Malloch, 1912)
Limosina discalis Malloch, 1912: 8 **syn.n.** - Buck.
Leptocera salatigae (de Meijere, 1914)
Limosina (Paracollinella) saegeri Vanschuytbroeck, 1959a: 74 **syn.n.** - Roháček.
Limosinella munda (Collin, 1912)
Limosinella polita Richards, 1968c: 106 **syn.n.** - Marshall.
Pterogramma inconspicuum (Malloch, 1914)
Leptocera (Pterogramma) orthoneura Spuler, 1925a: 102 **syn.n.** - Smith & Marshall
Pterogramma palliceps (Johnson, 1915)
Leptocera intrudens Malloch, 1922: 87 **syn.n.** - Smith & Marshall
Leptocera (Pteremis) flavifrons Spuler, 1924a: 133 **syn.n.** - Smith & Marshall
Rachispoda dolorosa (Williston, 1896)
Rachispoda luciana Wheeler in Wheeler & Marshall, 1995: 1222 **syn.n.** - Buck.
Spelobia (S.) costalis (Becker, 1920)
Spelobia (Spelobia) pulliforma Marshall, 1985a: 20 **syn.n.** - Marshall.

New combinations

COPROMYZINAE

Archiborborus alternatus (Rondani, 1868) **comb.n.**
[*Copromyza alternata* Rondani, 1868: 31]. - Norrbom.
Dudaia congoensis (Vanschuytbroeck, 1950) **comb.n.**
[*Borborus (Dudaia) congoensis* Vanschuytbroeck, 1950b: 5]. - Norrbom.
Dudaia simulatilis (Richards, 1980) **comb.n.**
[*Copromyza (Dudaia) simulatilis* Richards, 1980: 617]. - Norrbom.
Dudaia trispinosa (Vanschuytbroeck, 1959) **comb.n.**
[*Borborus (Dudaia) trispinosa* Vanschuytbroeck, 1959a: 63]. - Norrbom.
Dudaia tumida (Curran, 1931) **comb.n.**
[*Afroborborus tumidus* Curran, 1931: 9]. - Norrbom.
Dudaia uelensis (Vanschuytbroeck, 1959) **comb.n.**
[*Borborus (Dudaia) uelensis* Vanschuytbroeck, 1959a: 60]. - Norrbom.
Dudaia upembaensis (Vanschuytbroeck, 1959) **comb.n.**
[*Borborus (Dudaia) upembaensis* Vanschuytbroeck, 1959b: 37]. - Norrbom.
Norrbomia beckeri (Duda, 1938) **comb.n.**
[*Borborus (Borborillus) Beckeri* Duda, 1938: 52]. - Roháček & Norrbom.
Norrbomia cryptica (Papp, 1973) **comb.n.**
[*Copromyza (Borborillus) cryptica* Papp, 1973a: 377]. - Roháček & Norrbom.
Norrbomia fuscana (Becker, 1909) **comb.n.**
[*Borborus fuscanus* Becker, 1909: 120]. - Roháček & Norrbom.
Norrbomia micropyga (Papp, 1973) **comb.n.**
[*Copromyza (Borborillus) micropyga* Papp, 1973: 378]. - Roháček & Norrbom.
Norrbomia nilotica (Becker, 1903) **comb.n.**
[*Borborus niloticus* Becker, 1903b: 124]. - Norrbom.
Norrbomia niveipennis (Duda, 1923), **comb.n.**
[*Borborus (Borborillus) niveipennis* Duda, 1923: 89]. - Roháček & Norrbom.
Norrbomia tropica (Duda, 1923) **comb.n.**
[*Borborus (Borborillus) sordidus* var. *tropicus* Duda, 1923: 86]. - Norrbom.

Norrbomia unicolor (Becker,1908) **comb.n.**
[*Borborus unicolor* Becker, 1908a: 134]. - Norrbom.

SPHAEROCERINAE

Ischiolepta janssensi (Vanschuytbroeck, 1948) **comb.n.**
[*Sphaerocera (Lotobia) Janssensi* Vanschuytbroeck, 1948: 14]. - Roháček.
Mesosphaerocera facialis (Papp, 1978) **comb.n.**
[*Parasphaerocera facialis* Papp, 1978d: 380]. - Quiros.
Mesosphaerocera robusta (Kim, 1972) **comb.n.**
[*Parasphaerocera robusta* Kim, 1972b: 420]. - Quiros.
Neosphaerocera breviradiata (Papp, 1978) **comb.n.**
[*Sphaerocera breviradiata* Papp, 1978d: 372]. - Quiros.
Neosphaerocera paraflavicoxa (Papp, 1978) **comb.n.**
[*Parasphaerocera (Neosphaerocera) paraflavicoxa* Papp, 1978d: 381]. - Quiros.
Neosphaerocera parvula (Papp, 1978) **comb.n.**
[*Parasphaerocera (Taigetomyia) parvula* Papp, 1978d: 386]. - Quiros.
Neosphaerocera richardsi (Kim, 1968) **comb.n.**
[*Sphaerocera richardsi* Kim, 1968: 303]. - Quiros.
Parasphaerocera guttula (Richards, 1965) **comb.n.**
[*Sphaerocera (Parasphaerocera) guttula* Richards, 1965b: 236]. - Quiros.
Parasphaerocera pallipes (Malloch, 1914) comb.n.
[*Sphaerocera pallipes* Malloch, 1914b: 31]. - Quiros.

LIMOSININAE

Aluligera bicolor (Richards, 1965) **comb.n.**
[*Leptocera (Limosina) bicolor* Richards, 1965a: 450]. - Roháček.
Aluligera flavena (Richards, 1966) **comb.n.**
[*Leptocera (Limosina) flavena* Richards, 1966a: 236]. - Roháček.
Aluligera maculata (Richards, 1965) **comb.n.**
[*Uluguria maculata* Richards, 1965a: 441]. - Roháček.
Aluligera nigra (Richards, 1965) **comb.n.**
[*Uluguria nigra* Richards, 1965a: 442]. - Roháček.
Aluligera varicolor (Richards, 1957) **comb.n.**
[*Leptocera (Limosina) varicolor* Richards, 1957: 384]. - Marshall.
Aluligera vittigera (Richards, 1980) **comb.n.**
[*Leptocera (Limosina) vittata* Richards, 1966a: 233]. - Roháček.
Aluligera xanthographa (Richards, 1959) **comb.n.**
[*Leptocera (Limosina) xanthographa* Richards, 1959: 182]. - Roháček.
Biroina fenestrata (Richards, 1973**) comb.n.**
[*Leptocera (Limosina) fenestrata* Richards, 1973: 379]. - Marshall.
Bitheca xanthocephala (Spuler, 1925) **comb.n.**
[*Leptocera (Scotophilella) xanthocephala* Spuler, 1925c: 82]. - Buck & Marshall.
Chaetopodella impermissa (Richards, 1980) **comb.n.**
[*Leptocera (Chaetopodella) impermissa* Richards, 1980]. - Roháček.
Leptocera atra (Vanschuytbroeck, 1951) **comb.n.**
[*Paracollinella atra* Vanschuytbroeck, 1951b: 7]. - Buck & Roháček.

Leptocera basilewskyi (Vanschuytbroeck, 1962) **comb.n.**
[*Paracollinella basilewskyi* Vanschuytbroeck, 1962a: 473]. - Buck.
Limomyza brevifrons (Duda, 1925) **comb.n.**
[*Leptocera (Ceroptera) brevifrons* Duda, 1925: 138]. - Marshall.
Limosinella munda (Collin, 1912) **comb.n.**
[*Limosina munda* Collin, 1912: 103]. - Marshall.
Minilimosina (M.) knightae (Harrison, 1959) **comb.n.**
[*Leptocera (Limosina) knightae* Harrison, 1959: 273]. - Marshall.
Minilimosina (M.) kozaneki (Kuznetzova, 1991) **comb.n.**
[*Trachyopella kozaneki* Kuznetzova, 1991: 55]. - Roháček.
Minilimosina (S.) puncticorpoides (Papp, 1973) **comb.n.**
[*Limosina puncticorpoides* Papp, 1973a: 409]. - Roháček.
Phthitia popularis (Richards, 1973) **comb.n.**
[*Leptocera (Limosina) popularis* Richards, 1973: 378]. - Roháček.
Pseudocollinella difficilis (Richards, 1973) **comb.n.**
[*Leptocera* (*Pseudocollinella*) *difficilis* Richards, 1973: 317]. - Marshall.
Pseudocollinella nasalis (Richards, 1973) **comb.n.**
[*Leptocera (Pseudocollinella) nasalis* Richards, 1973: 318]. - Marshall.
Pteremis wirthi (Marshall, 1984) **comb.n.**
[*Leptocera (Pteremis) wirthi* Marshall, 1984: 397]. - Marshall.
Pteremis unica (Spuler, 1924) **comb.n.**
[*Leptocera (Pteremis) unica* Spuler, 1924a: 134]. - Marshall.
Pterogramma inconspicuum (Malloch, 1914) **comb.n.**.
[*Leptocera (Limosina) inconspicua* Malloch, 1914a: 16]. - Smith & Marshall.
Pterogramma luxor (Spuler, 1925) **comb.n.**
[*Leptocera (Pterogramma) luxor* Spuler 1925a: 101]. - Smith & Marshall.
Pterogramma madare (Spuler, 1925) **comb.n.**
[*Leptocera (Pterogramma) madaris* Spuler, 1925a: 102]. - Smith & Marshall.
Pterogramma meridionale (Malloch, 1914) **comb.n.**
[*Leptocera (Limosina) meridionalis* Malloch, 1914a: 13]. - Smith & Marshall.
Pterogramma monticola (Malloch, 1914) **comb.n.**
[*Leptocera (Limosina) monticola* Malloch, 1914a: 14]. - Smith & Marshall.
Pterogramma ovipenne (Duda, 1925) **comb.n.**
[*Leptocera (Mallochella) ovipennis* Duda, 1925: 115]. - Smith & Marshall.
Pterogramma parameridionale (Duda, 1925) **comb.n.**
[*Leptocera (Mallochella) parameridionalis* Duda, 1925: 108]. - Smith & Marshall.
Pterogramma poecilopterum (Malloch, 1914) **comb.n.**
[*Leptocera (Limosina) poeciloptera* Malloch, 1914a: 11]. - Smith & Marshall.
Pterogramma robustum (Spuler, 1925) **comb.n.**
[*Leptocera (Scotophilella) robusta* Spuler, 1925c: 81]. - Smith & Marshall.
Pterogramma rutilans (Duda, 1925) **comb.n.**
[*Leptocera (Mallochella) rutilans* Duda, 1925: 106]. - Smith & Marshall.
Pterogramma simplicicrus (Duda, 1925) **comb.n.**
[*Leptocera (Mallochella) simplicicrus* Duda, 1925: 112]. - Smith & Marshall.
Pterogramma sublugubrinum (Malloch, 1912) **comb.n.**
[*Limosina sublugubrina* Malloch, 1912: 8]. - Smith & Marshall.
Pterogramma substitutum (Richards, 1961) **comb.n.**
[*Leptocera (Pterogramma) substituta* Richards, 1961b: 563]. - Smith & Marshall.

Pterogramma substriatum (Duda, 1925) **comb.n.**
[*Leptocera (Mallochella) substriata* Duda, 1925: 109]. - Smith & Marshall.
Pterogramma vittatum (Malloch, 1914) **comb.n.**
[*Leptocera (Limosina) vittata* Malloch, 1914a: 12]. - Smith & Marshall.
Pullimosina (P.) meruina (Richards, 1965) **comb.n.**
[*Leptocera (Limosina) meruina* Richards, 1965a: 446]. - Roháček.
Pullimosina (P.) propecaeca (Richards, 1966) **comb.n.**
[*Leptocera (Limosina) propecaeca* Richards, 1966a: 243]. - Roháček.
Rachispoda aemula (Roháček, 1993) **comb.n.**
[*Leptocera (Rachispoda) aemula* Roháček, 1993a: 115]. - Roháček.
Rachispoda aequalitarsis (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) aequalitarsis* Duda, 1925: 24]. - Roháček.
Rachispoda afghanica (Papp, 1978) **comb.n.**
[*Leptocera (Rachispoda) afghanica* Papp, 1978a: 160]. - Roháček.
Rachispoda afra (Roháček, 1991) **comb.n.**
[*Leptocera (Rachispoda) afra* Roháček, 1991b: 260]. - Roháček.
Rachispoda anceps (Stenhammar, 1855) **comb.n.**
[*Limosina anceps* Stenhammar, 1855: 372]. - Roháček.
Rachispoda ariana (Papp, 1978) **comb.n.**
[*Leptocera (Rachispoda) ariana* Papp, 1978: 161]. - Roháček.
Rachispoda aroana (Richards, 1973) **comb.n.**
[*Leptocera (Rachispoda) aroana* Richards, 1973: 310]. - Roháček.
Rachispoda atrolimosa (Frey, 1945) **comb.n.**
[*Leptocera (Collinellula) atrolimosa* Frey, 1945: 75]. - Roháček.
Rachispoda australica (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) australica* Duda, 1925: 30]. - Roháček.
Rachispoda awalensis (Richards, 1973) **comb.n.**
[*Leptocera (Limosina) awalensis* Richards, 1973: 374]. - Buck.
Rachispoda barbata (Sabrosky, 1949) **comb.n.**
[*Leptocera barbata* Sabrosky, 1949: 16]. - Roháček.
Rachispoda boninensis (Richards) **comb.n.**
[*Leptocera (Rachispoda) boninensis* Richards, 1963a: 115]. - Roháček.
Rachispoda breviceps (Stenhammar, 1855) **comb.n.**
[*Limosina breviceps* Stenhammar, 1855: 374]. - Roháček.
Rachispoda breviseta (Malloch, 1914) **comb.n.**
[*Leptocera (Limosina) breviseta* Malloch, 1914a: 23]. - Roháček.
Rachispoda cilifera (Rondani, 1880) **comb.n.**
[*Limosina cilifera* Rondani, 1880: 22]. - Roháček.
Rachispoda congoensis (Vanschuytbroeck, 1950) **comb.n.**
[*Limosina (Collinelulla) congoensis* Vanschuytbroeck, 1950a: 19]. - Roháček.
Rachispoda conradti (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) acrosticalis* var. *Conradti* Duda, 1925: 47]. - Roháček.
Rachispoda cryptica (Sabrosky, 1949) **comb.n.**
[*Leptocera cryptica* Sabrosky, 1949: 12]. - Roháček.
Rachispoda cryptochaeta (Duda, 1918) **comb.n.**
[*Limosina (Collinella) breviceps* var. *cryptochaeta* Duda, 1918: 64]. - Roháček.
Rachispoda disciseta (Richards, 1963) **comb.n.**
[*Leptocera (Rachispoda) disciseta* Richards, 1963a: 116]. - Roháček.

Rachispoda dolorosa (Williston, 1896) **comb.n.**
[*Limosina dolorosa* Williston, 1896: 432]. - Buck.
Rachispoda duodecimseta (Papp, 1973) **comb.n.**
[*Leptocera (Rachispoda) duodecimseta* Papp, 1973a: 419]. - Roháček.
Rachispoda duplex (Roháček, 1991) **comb.n.**
[*Leptocera (Rachispoda) duplex* Roháček, 1991b: 148]. - Roháček.
Rachispoda excavata (Papp, 1979) **comb.n.**
[*Leptocera (Rachispoda) excavata* Papp, 1979c: 226]. - Roháček.
Rachispoda filiforceps (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) filiforceps* Duda, 1925: 40]. - Roháček.
Rachispoda forceps (Sabrosky, 1949) **comb.n.**
[*Leptocera forceps* Sabrosky, 1949: 10]. - Roháček.
Rachispoda freyi (Hackman, 1958) **comb.n.**
[*Collinellula freyi* Hackman, 1958a: 49]. - Roháček.
Rachispoda fumipennis (Spuler, 1924) **comb.n.**
[*Leptocera (Collinella) fumipennis* Spuler, 1924b: 10]. - Roháček.
Rachispoda gobiensis (Papp, 1974) **comb.n.**
[*Leptocera (Rachispoda) gobiensis* Papp, 1974d: 265]. - Roháček.
Rachispoda hammersteini (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) Hammersteini* Duda, 1925: 36]. - Roháček.
Rachispoda hostica (Villeneuve, 1917) **comb.n.**
[*Leptocera* (*Limosina*) *hostica* Villeneuve, 1917a: 140]. - Roháček.
Rachispoda iberica (Roháček, 1991) **comb.n.**
[*Leptocera (Rachispoda) iberica* Roháček, 1991b: 146]. - Roháček.
Rachispoda intermedia (Duda, 1918) **comb.n.**
[*Limosina (Collinella) fuscipennis* var. *intermedia* Duda, 1918: 58]. - Roháček.
Rachispoda kuntzei (Duda, 1918) **comb.n.**
[*Limosina (Collinella) Halidayi* var. *Kuntzei* Duda, 1918: 51]. - Roháček.
Rachispoda lagura (Roháček, 1991) **comb.n.**
[*Leptocera* (*Rachispoda*) *lagura* Roháček, 1991b: 214]. - Roháček.
Rachispoda latiforceps (Sabrosky, 1949) **comb.n.**
[*Leptocera latiforceps* Sabrosky, 1949: 21]. - Roháček.
Rachispoda longior (Roháček, 1991) **comb.n.**
[*Leptocera (Rachispoda) longior* Roháček, 1991b: 156]. - Roháček.
Rachispoda lugubrina (Zetterstedt, 1847) **comb.n.**
[*Limosina lugubrina* Zetterstedt, 1847: 2502]. - Roháček.
Rachispoda lutosa (Stenhammar, 1855) **comb.n.**
[*Limosina lutosa* Stenhammar, 1855: 380]. - Roháček.
Rachispoda macalpinei (Richards, 1973) **comb.n.**
[*Leptocera (Rachispoda) macalpinei* Richards, 1973: 311]. - Roháček.
Rachispoda meges (Papp, 1978) **comb.n.**
[*Leptocera (Rachispoda) meges* Papp, 1978a: 165]. - Roháček.
Rachispoda melanderi (Sabrosky, 1949) **comb.n.**
[*Leptocera melanderi* Sabrosky, 1949: 20]. - Roháček.
Rachispoda michigana (Sabrosky, 1949) **comb.n.**
[*Leptocera michigana* Sabrosky, 1949: 14]. - Roháček.
Rachispoda microarista (Papp, 1973) **comb.n.**
[*Leptocera (Rachispoda) microarista* Papp, 1973a: 421]. - Roháček.

Rachispoda micropyga (Papp, 1978) **comb.n.**
[*Leptocera (Rachispoda) micropyga* Papp, 1978a: 166]. - Roháček.
Rachispoda modesta (Duda, 1924) **comb.n.**
[*Limosina (Collinella) modesta* Duda, 1924b: 170]. - Roháček.
Rachispoda mycophora (Munari, 1995) **comb.n.**
[*Leptocera (Rachispoda) mycophora* Munari, 1995a: 113]. - Roháček.
Rachispoda nebulosa (de Meijere, 1916) **comb.n.**
[*Limosina nebulosa* de Meijere, 1916a: 211]. - Roháček.
Rachispoda obfuscata (Tucker, 1907) **comb.n.**
[*Limosina obfuscata* Tucker, 1907: 103]. - Roháček.
Rachispoda ochrocephala (Munari, 1989) **comb.n.**
[*Leptocera (Rachispoda) ochrocephala* Munari, 1989a: 70]. - Roháček.
Rachispoda octisetosa (Becker, 1903) **comb.n.**
[*Limosina octiesetosa* Becker, 1903b: 127]. - Roháček.
Rachispoda omega (Sabrosky, 1949) **comb.n.**
[*Leptocera omega* Sabrosky, 1949: 21]. - Roháček.
Rachispoda opinata (Roháček, 1991) **comb.n.**
[*Leptocera* (*Rachispoda*) *opinata* Roháček, 1991b: 131]. - Roháček.
Rachispoda papuana (Richards, 1973) **comb.n.**
[*Leptocera (Rachispoda) papuana* Richards, 1973: 308]. - Roháček.
Rachispoda paralutosa (Papp, 1973) **comb.n.**
[*Leptocera (Rachispoda) paralutosa* Papp, 1973a: 421]. - Roháček.
Rachispoda persica (Roháček, 1993) **comb.n.**
[*Leptocera (Rachispoda) persica* Roháček, 1993a: 108]. - Roháček.
Rachispoda praeapicalis (Papp, 1979) **comb.n.**
[*Leptocera (Rachispoda) praeapicalis* Papp, 1979c: 227]. - Roháček.
Rachispoda promissa (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) promissa* Duda, 1925: 23]. - Roháček.
Rachispoda pseudocilifera (Papp, 1974) **comb.n.**
[*Leptocera (Rachispoda) pseudocilifera* Papp, 1974d: 266]. - Roháček.
Rachispoda pseudohostica (Duda, 1924) **comb.n.**
[*Limosina (Collinella) pseudohostica* Duda, 1924b: 172]. - Roháček.
Rachispoda pseudooctisetosa (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) pseudooctisetosa* Duda, 1925: 27]. - Roháček.
Rachispoda quadrilineata (de Meijere, 1918) **comb.n.**
[*Limosina quadrilineata* de Meijere, 1918: 324]. - Roháček.
Rachispoda quadriseta (Duda, 1938) **comb.n.**
[*Limosina (Collinellula) quadriseta* Duda, 1938: 81]. - Roháček.
Rachispoda richardsi (Sabrosky, 1949) **comb.n.**
[*Leptocera richardsi* Sabrosky, 1949: 18]. - Roháček.
Rachispoda rutshuruensis (Vanschuytbroeck, 1950) **comb.n.**
[*Limosina (Collinellula) rutshuruensis* Vanschuytbroeck, 1950a: 21]. - Roháček.
Rachispoda sajanica (Papp, 1979) **comb.n.**
[*Leptocera (Rachispoda) sajanica* Papp, 1979c: 229]. - Roháček.
Rachispoda sauteri (Duda, 1925) **comb.n.**
[*Leptocera (Collinella) Sauteri* Duda, 1925: 26]. - Roháček.
Rachispoda scotti (Richards, 1939) **comb.n.**
[*Leptocera (Rachispoda) scotti* Richards, 1939: 68]. - Roháček.

Rachispoda segem (Roháček, 1991) **comb.n.**
[*Leptocera* (*Rachispoda*) *segem* Roháček, 1991: 127]. - Roháček.
Rachispoda spinicaudata (Papp, 1973) **comb.n.**
[*Leptocera (Rachispoda) spinicaudata* Papp, 1973a: 422]. - Roháček.
Rachispoda spinisterna (Papp, 1974) **comb.n.**
[*Leptocera (Rachispoda) spinisterna* Papp, 1974d: 266]. - Roháček.
Rachispoda suberecta (Sabrosky, 1949) **comb.n.**
[*Leptocera suberecta* Sabrosky, 1949: 20 [male, illustr.]. - Roháček.
Rachispoda subtinctipennis (Brunetti, 1913) **comb.n.**
[*Limosina subtinctipennis* Brunetti, 1913: 174]. - Roháček.
Rachispoda tenaculata (Sabrosky, 1949) **comb.n.**
[*Leptocera tenaculata* Sabrosky, 1949: 16]. - Roháček.
Rachispoda territorialis (Richards, 1973) **comb.n.**
[*Leptocera (Rachispoda) territorialis* Richards, 1973: 313]. - Roháček.
Rachispoda trifascigera (Malloch, 1928) **comb.n.**
[*Leptocera (Collinella) trifascigera* Malloch, 1928: 326]. - Roháček.
Rachispoda tuberosa (Duda, 1938) **comb.n.**
[*Limosina (Collinellula) tuberosa* Duda, 1938: 83]. - Roháček.
Rachispoda unca (Roháček, 1993) **comb.n.**
[*Leptocera (Rachispoda) unca* Roháček, 1993a: 112]. - Roháček.
Rachispoda uniseta (Roháček, 1991) **comb.n.**
[*Leptocera* (*Rachispoda*) *uniseta* Roháček, 1991b: 143]. - Roháček.
Rachispoda urodela (Sabrosky, 1949) **comb.n.**
[*Leptocera urodela* Sabrosky, 1949: 18]. - Roháček.
Rachispoda velutina (Séguy, 1933) **comb.n.**
[*Leptocera velutina* Séguy, 1933: 45]. - Roháček.
Rudolfina prominens (Duda, 1925) **comb.n.**
[*Leptocera (Acuminiseta) prominens* Duda, 1925: 124]. - Marshall.
Sclerocoelus clarae (Papp, 1973) **comb.n.**
[*Limosina clarae* Papp, 1973a: 388]. - Roháček.
Spelobia (S.) costalis (Becker, 1920) **comb.n.**
[*Limosina costalis* Becker, 1920: 182]. - Marshall.
Spinilimosina tetrasticha (Richards, 1973) **comb.n.**
[*Leptocera (Limosina) tetrasticha* Richards, 1973: 380]. - Marshall.
Trachyopella (T.) hyalinervis (Duda, 1925) **comb.n.**
[*Leptocera (Trachyopella) hyalinervis* Duda, 1925: 201]. - Marshall.
Trachyopella (T.) perparva (Williston, 1896) **comb.n.**
[*Limosina perparva* Williston, 1896: 433]. - Marshall.

Taxa restituted from synonymy

Norrbomia nilotica (Becker, 1903) **sp.restit.**
[*Borborus niloticus* Becker, 1903b: 124]. - Norrbom.
Norrbomia unicolor (Becker,1908) **sp.restit.**
[*Borborus unicolor* Becker, 1908a: 134]. - Norrbom.
Parasphaerocera xiphosternum (Richards, 1965) **sp. restit.**
[*Sphaerocera (Parasphaerocera) xiphosternum* Richards, 1965b: 232]. – Quiros

Designations and notes on primary type material

COPROMYZINAE

calcaratus Vanschuytbroeck, 1948: 39 *Borborus (Metaborborus)*.

Lectotype male (MRAC); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "Congo Belge, Parc National Albert, riv. Bishakishaki - Kamatembe", "plaine de lave, 2100 m., 7-23.I.1935, G. F. de Witte"; "Holotype Borborus (Metaborborus) calcaratus Vanschuytbroeck". The lectotype belongs to the species currently known as *Metaborborus calcaratus* (Vanschuytbroeck) (see Norrbom & Kim, 1985d: 30). Although Vanschuytbroeck labelled this specimen as holotype, it was not designated as such in the original description, and the use of this term by Norrbom & Kim (1985d: 30) is invalid. Because the type series contains a mix of species, the above male is designated as lectotype to maintain the current usage of this name.

costalis Zetterstedt, 1847: 2483 *Copromyza*.

Lectotype male (ZMUC); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "♂ St"; "costalis Zett" [in Staeger's writing]; [yellow] "Coll. Staeger"; "LECTOTYPE ♂ Copromyza costalis Zetterstedt by Norrbom". The lectotype belongs to the species currently known as *Norrbomia costalis* (Zetterstedt), which belongs to a complex of species that can only be separated by genitalic characters. Perhaps the most distinctive characters of this species are the shape of its paramere, which has a long, slender apical lobe (see Hackman 1965b, Fig. 35), and that of the male cercus. I have not dissected the lectotype, but its cerci are visible. Zetterstedt described this species based on an unstated number of specimens of both sexes sent to him by Staeger from "Hafnia" [Copenhagen]. Kim (1972a: 208) reported no syntypes in the MZLU (verified by H. Andersson, in litt.) and the 2 specimens he listed in the NHRS are from Sweden and are not syntypes, nor are there any valid syntypes of *costalis* in that collection (P. I. Persson, in litt.). The lectotype does not have a label in Zetterstedt's writing, but its label in Staeger's writing indicates that it is probably a valid type.

fimetarius Meigen 1830: 202 *Borborus*.

Neotype male (USNM); here designated by A. L. Norrbom, labelled: [green] "22.7.21"; "Wustung b. Habelschwerdt, l. Duda" [= Bystrzyca Kłodska, Poland]; "St. suillorum Hal. ♂" [Duda's writing]; "fimetarius Mg. ♂" [Duda's writing]; [red] "NEOTYPE ♂ USNM Borborus fimetarius Meigen 1830: 202, desig. Norrbom". The neotype belongs to the species currently known as *Crumomyia fimetaria* (Meigen) (see Norrbom & Kim, 1985a: 207). Meigen (1830) gave no information about the habits of this species or the number of specimens he studied, so any putative types should be considered syntypes. Presumably he collected them himself in the area of Stolberg, Germany (see Pont, 1986). There are no specimens in the NHMW collection labelled as this species by Meigen. In the Meigen Collection (MNHN) there is a single, teneral female of *Crumomyia glabrifrons* (Meigen) under No. 2648 with the following labels: [circular white accession label added by MNHN] "meigen" on one side, "2848, 40" on other; "Borborus fimetarius ♂" in Meigen's writing. The fact that the sex does not match the label and that the pale brown color of the specimen does not match Meigen's description and drawing (see Morge, 1976, pl. CLXIII, 5) of this species as black suggest that it is mislabeled or at least that Meigen had additional specimens that have been lost. I regard it as a nontype and therefore designate the above male as neotype to clarify and maintain the current usage of this name.

fuscipennis Zetterstedt 1847: 2481 *Copromyza*.

Lectotype male (MZLU); here designated by A. L. Norrbom to stabilize the concept of the name, labelled: "C. fuscipennis ♂ Umenäs" in Zetterstedt's writing and also with a tiny black

square indicating that it was collected on a voyage to North Sweden and Norway in 1832 (H. Andersson, in litt.). This matches some of the type data given by Zetterstedt "in Lapponia Umensi ad Novaccolum Umenäs marem d. 8 Aug. 1832 invenit D. Dahlbom". This male, in the Insecta Lapponica Collection, is the species currently known as *Crumomyia glabrifrons* (Meigen). A female paralectotype in the Wallengren Collection (MZLU) is also *C. glabrifrons*. It has a tiny reddish rectangle [= collected in Lund area] and labels with: "C. fuscipenis, [a smeared word, possibly Lund] Paradist. [another smeared word]" [in Zetterstedt's writing]; and "C. fuscipennis Staeg" [writing not identified]. Also see the type information for *Copromyza umbripennis* Zetterstedt in this section. Duda (1923) considered *C. fuscipennis* a synonym of *Crumomyia fimetaria* (Meigen), whereas Papp (1984) treated this name as a nomen dubium.

glabrifrons Meigen, 1830: 202 *Borborus*.

Lectotype female (MNHN); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: [circular white accession label added by MNHN] "meigen" on one side, "2849, 40" on other; "glabrifrons" in Meigen's writing; [red; added by Norrbom] "Lectotype Borborus glabrifrons Meigen". The lectotype belongs to the species currently known as *Crumomyia glabrifrons* (Meigen) (see Norrbom & Kim, 1985a: 211). Meigen (1830) gave no information about the habits of this species or the number of specimens he studied, so this single specimen in the Meigen Collection (under Cat. No. 2649) should be regarded as a syntype. It presumably was collected by Meigen in the area of Stolberg, Germany. The lectotype fits Meigen's description except for his statement that the frons is entirely glabrous ("Stirne ist ganz glatt, glänzend"), but no European Copromyzinae entirely lack microtrichia on the frons and *C. glabrifons* has relatively large nonmicrotrichose areas.

glacialis Meigen 1830: 294 *Borborus*.

Meigen's description did not state the number of specimens he studied, so the single specimen in the NHMW should be regarded as a syntype, and Becker's (1902: 347) treatment of this specimen as "Die Type" should be considered a lectotype designation by inference of holotype. In addition to the locality label described by Norrbom & Kim (1985a: 213), it also bears labels with: "glacialis" in Meigen's writing; "glacialis Coll. Winth."; [red] "TYPE"; and "Holotype Borborus glacialis Meigen".

incanus Meigen 1830: 206 *Borborus*.

Lectotype male (NHMW); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "incanus" in Meigen's writing; "incanus Coll. Winth."; [red] "TYPE" [both added by NHMW workers]; "equinus Fl det Duda" in Duda's writing; [red; added by Norrbom] "Lectotype Borborus incanus Meigen". The lectotype belongs to the species currently known as *Copromyza equina* (Fallén) (see Norrbom & Kim, 1985b: 344). It is heavily covered with whitish dust, matching Meigen's description of *incanus* as light ash gray and his illustration (see Morge, 1976, pl. CCXIV, 18). Meigen stated that specimen(s) he studied (number unstated) were collected by Winthem in the region of Paris.

luridus Meigen 1830: 203 *Borborus*.

Lectotype female (NHMW); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "luridus Coll. Winth."; [red] "TYPE" [both added by NHMW workers]; [red; added by Norrbom] "Lectotype Borborus luridus Meigen". The lectotype belongs to the species currently known as *Copromyza equina* (Fallén) (see Norrbom & Kim, 1985b: 344). With it in the NHMW collection are 3 males of *Copromyza equina* and 2 females of *Copromyza nigrina* (Gimmerthal), all of which also have the "luridus Coll. Winth." label. One of the *C. equina* males also has a label with "luridus" in Meigen's writing and a label with "equinus" in Duda's writing. One of the females of *C. nigrina* also has a red "TYPE" label. Meigen (1830) stated in the original description that he studied 2 females

collected by Winthem, thus the male specimens cannot be syntypes. The female of *C. equina* is designated as lectotype to maintain the usage of this name and conserve that of the younger name *C. nigrina*. All of the syntypes are teneral, fitting Meigen's description and illustration (see Morge, 1976, pl. CCXIV, 15) of *luridus* as mostly brownish and red yellow. They were probably collected in the Hamburg area, where Winthem lived (Pont, 1986).

marmoratus Becker, 1908a: 133 *Borborus*.

Lectotype male (ZMHB); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "Teneriffe 46613 /XII"; "LECTOTYPE ♂ Borborus marmoratus Becker by Norrbom". The lectotype belongs to the species currently known as *Norrbomia marginatis* (Adams) (see Papp, 1988: 405). It was placed in the ZMHB collection along with 4 paralectotypes (1 pair labelled "La Palma 47504. IV", 1 also with "marmoratus det. Becker", and 2 females labelled "Laguna 47609. IV") and a nontype pair labelled "Gr. Canaria 47798. V.", the male also with "Borborus marmoratus det. Becker". Becker stated that his specimens were from "Teneriffe und La Palma. Von Dezember bis April."

nervosus Meigen, 1838: 407 *Borborus*.

Lectotype female (MNHN); here designated by A. L. Norrbom to stabilize the concept of the name, labelled: [circular white accession label added by MNHN] "meigen" on one side, "2852, 40" on other; "Borborus nervosus" in Meigen's writing; "Beiern" in Meigen's writing; [red; added by Norrbom] "Lectotype Borborus nervosus Meigen". The lectotype belongs to the species currently known as *Copromyza equina* (Fallén) (see Norrbom & Kim, 1985b: 344). Meigen stated that the specimen(s) he studied were from "Baiern" [Germany, Bavaria]. Of the European Copromyzinae, Meigen's description and illustration (see Morge, 1976, pl. CCLXXXIX, 6), particularly the extensive, distinct, brown bordering of the longitudinal veins and the orange anterior area of the frons, best fit *Copromyza neglecta* (Malloch). The latter character occurs in various *Copromyza* and *Crumomyia* species, but the former is distinct only in some *C. neglecta*. It is rarely present and even then is extremely faint except on the crossveins in *Crumomyia nitida* (Meigen), which Duda suggested as the possible identity of *B. nervosus*. *Copromyza neglecta* has not been reported from Bavaria, but could occur there as it is known from the Czech Republic. The Meigen determination label on the lectotype is very possibly misplaced, but in order to conserve the usage of the younger name *neglecta*, I am assuming that this MNHN female was mixed among the specimens Meigen described as *nervosus*, and designate it as lectotype.

niger Meigen, 1830: 201 *Borborus*.

Lectotype male (MNHN); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: [circular white accession label added by MNHN] "meigen" on one side, "2846, 40" on other; "Borborus niger ♂" in Meigen's writing; [red; added by Norrbom] "Lectotype Borborus niger Meigen". The lectotype belongs to the species currently known as *Crumomyia nigra* (Meigen) (see Norrbom & Kim, 1985a: 200) and is consistent with Meigen's illustration (see Morge, 1976, pl. CLXIII, 4) and description of this species, particularly his statement that it is "haarig"; the male katepisternum, legs, and abdominal pleura are especially densely long pilose. A female of *C. nigra*, without abdomen, and a female of *Lotophila atra* (Meigen) are with the lectotype in the Meigen Collection under No. 2646. The male in the NHMW designated as lectotype by Norrbom & Kim (1985a) does not have a Meigen label and is doubtfully a syntype. Meigen did not state the type locality but his statement that this species "Im Frühlinge auf Dünger gemein" [in Spring common on dung] indicates that he saw multiple specimens that he probably collected himself in the area of Stolberg, Germany.

nitidifrons Duda, 1923: 86 *Borborus (Borborillus)*.

Lectotype male (ZMHB); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: [yellow] "15.10.15"; "Ilfeld, S. Harz, Duda"; "nitidifrons D. ♂ d. Duda" [in Duda's writing]; "LECTOTYPE ♂ Borborus nitidifrons Duda by Norrbom". The lectotype is conspecific with the holotype of *Norrbomia nilotica* (Becker). This species, as indicated by Duda (1923: 57, as *nitidifrons*), differs from its congeners in central Europe in having 3 small nonmicrotrichose areas on the frons. Duda described *B. nitidifrons* and *B. opacifrons* in a confusing joint description (p. 86-89), in which he also listed several names in synonymy, including *niloticus* Becker and "*costalis* Stnhm., Zett.?" and also used the latter name to apparently refer to both species together or to specimens that could be either species (perhaps meaning what would today be called a species group or complex). He reported specimens examined from multiple localities, but did not indicate which were *nitidifrons* or *opacifrons*. However, because he stated that he himself collected specimens of "*costalis* . . . in seinen verschiedenen Abarten" [in its various varieties] in the Harz and in Westfalen, I regard any specimens he collected and identified from those regions prior to 1923 to be valid syntypes. The lectotype was chosen from among a series of specimens from Ilfeld, S. Harz that Duda labelled as *nitidifrons* and is consistent with his diagnosis. One pin with 3 paralectotypes has a label with "Borborus costalis Zett. nitidifrons m. det. Duda". Although *nitidifrons* has been the prevailing name used for *N. nilotica*, mainly due to Duda's erroneous usage, it does not meet all conditions to be considered a *nomen protectum* and *nilotica* is the valid name. Duda (1923) reported examining the *niloticus* holotype and considered it to belong to "*costalis*" in the broad sense, and he later (Duda, 1938: 55) treated this name as a possible synonyn of *B. nitidifrons* or *B. costalis*.

opacifrons Duda, 1923: 86 *Borborus (Borborillus)*.

Lectotype male (ZMHB); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: [yellow] "22.9.15" "Ilfeld, S. Harz, Duda"; "Borborillus opacifrons D. ♂ d. Duda" in Duda's writing; "LECTOTYPE ♂ Borborus opacifrons Duda by Norrbom". The lectotype belongs to the species currently known as *Norrbomia costalis* (Zetterstedt) (see discussion of *Copromyza costalis* in this section). Duda described *B. opacifrons* and *B. nitidifrons* in a confusing joint description (p. 86-89), in which he also listed several names in synonymy, including "*costalis* Stnhm., Zett.?", and also used the latter name to apparently refer to both species together or to specimens that could be either species (perhaps meaning what would today be called a species group or complex). He reported specimens examined from multiple localities, but did not indicate which were *nitidifrons* or *opacifrons*. However, because he stated that he himself collected specimens of "*costalis* ... in seinen verschiedenen Abarten" [in its various varieties] in the Harz and in Westfalen, I regard any specimens he collected and identified from those regions prior to 1923 to be valid syntypes. The lectotype was chosen from among a series of specimens from Ilfeld, S. Harz that Duda labelled as *opacifrons* and is consistent with his diagnosis. Duda (1938: 52) correctly treated this name as a synonym of *B. costalis*.

pallipes Meigen 1830: 204 *Borborus*.

Lectotype male (NHMW); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "pallipes" in Meigen's writing; "pallipes Coll. Winth."; [red] "TYPE" [both added by NHMW workers]; "equinus Fl d. Duda" in Duda's writing; [red; added by Norrbom] "Lectotype Borborus pallipes Meigen". The lectotype belongs to the species currently known as *Copromyza equina* (Fallén) (see Norrbom & Kim, 1985b: 344). A female of *C. equina* with the same labels as the lectotype except the Meigen label, and a female of *Lotophila atra* (Meigen) with a "pallipes Coll. Winth." label and "genicul" in Duda's writing are also in the NHMW. Meigen's description stated that he saw specimens of both sexes from Winthem. They were probably collected in the Hamburg area, where Winthem lived. The

identity of the lectotype is consistent with both Meigen's description and illustration (see Morge, 1976, pl. CCXIV, 16), the latter probably of a slightly teneral specimen.

parallelinervis Duda, 1938: 56 *Borborus (Borborillus) niveipennis* var.

Lectotype male (ZMHB); here designated by A. L. Norrbom to stabilize the concept of the name, labelled: “Tarifa Czerny” and on back “25/4.07”; “Borborillus parallelinervis Duda ♂” [in Duda’s writing]; a large red rectangle; “LECTOTYPE ♂ Borborus niveipennis var. parallelinervis Duda by Norrbom”. The female paralectotype has the same first three labels, except ♀ instead of ♂ on the Duda determination label. Their label data match the data “Tarifa. Czerny, 25.4.07” in Duda’s original description of this variety, based on 1 male and 1 female “In Coll. Czerny”. The lectotype is the species that has generally been called *Norrbomia niveipennis* (Duda), and Papp (1984) treated *parallelinervis* as a synonym of that name, but at least the Iranian syntypes of the *niveipennis* are a different species. The *parallelinervis* lectotype may be conspecific with the *niveipennis* syntypes from Tunisia (not examined), however, and revision of the *niveipennis* syntypes and designation of a lectotype for that name are needed to clarify the status of the name *parallelinervis*.

pedestris Meigen 1830: 209 *Borborus*.

Lectotype female (NHMW); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "pedestris" in Meigen's writing; "pedestris Coll. Winth."; [red] "TYPE" [both added by NHMW workers]; [red; added by Norrbom] "Lectotype Borborus pedestris Meigen". The lectotype belongs to the species currently known as *Crumomyia pedestris* (Meigen) (see Norrbom & Kim, 1985a: 189). Meigen's description mentioned both the male and female and he also illustrated both sexes (see Morge, 1976, pl. CCXIV, 19; the male is also shown in Meigen, 1830, Taf. 62, 21), so he clearly saw multiple specimens, and the lectotype cannot be considered a holotype as it was treated by Norrbom & Kim (1985a). The NHMW collection includes another female and a male of *C. pedestris* that also have "pedestris Coll. Winth." labels. The female is presumably a paralectotype, but the male also has a label with "Breslau" [=Wrocław, Poland] and cannot be a syntype because Meigen stated that the specimens he examined were collected by Winthem at Hamburg.

pilifer Vanschuytbroeck, 1948: 38 *Borborus (Gymnometopina)*.

Lectotype male (MRAC); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "Congo Belge, Parc National Albert, riv. Bishakishaki - Kamatembe, "plaine de lave, 2100 m., 7-23.I.1935, G. F. de Witte"; "Holotype Borborus (Gymnometopina) pilifer Vanschuytbroeck". The lectotype belongs to the species currently known as *Metaborborus pilifer* (Vanschuytbroeck) (see Norrbom & Kim, 1985d: 31). Although Vanschuytbroeck labelled this specimen as holotype, it was not designated as such in the original description, and the use of this term by Norrbom & Kim (1985d: 31) is invalid. Because the type series contains a mix of species, the above male is designated as lectotype to maintain the current usage of this name.

rufipes Meigen 1830: 204 *Borborus*.

Lectotype male (NHMW); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "rufipes" and "Mont An---t [middle letters unclear] 3 Oct." in Meigen's writing; "rufipes Coll. Winth."; [red] "TYPE" [both added by NHMW workers]; "equinus Fln. d. Dud" in Duda's writing; [red; added by Norrbom] "Lectotype Borborus rufipes Meigen". The lectotype belongs to the species currently known as *Copromyza equina* (Fallén) (see Norrbom & Kim, 1985b: 344). A second male of *C. equina* with only the "rufipes Coll. Winth." and "TYPE" labels is also in the NHMW collection. Both specimens are slightly teneral. The lectotype has a depression in the scutellum matching Meigen's description ("Schildchen ziegelbraun, an der Spitze mit ein Grübchen") and illustration (see Morge, 1976, pl. CCXV, 2), although the latter is of a female. Meigen stated that the

specimens he saw (number unstated) were collected by Winthem in "Thale Chamouny" [France, Haute Savoie, Chamonix Valley]. I cannot decipher the locality label, but the date is the same as that on the lectotype of *Crumomyia glacialis*, collected by Winthem on Mont Blanc.

saniosa Westring 1814: 51 *Musca*.

Lectotype female (NHRS); here designated by A. L. Norrbom to stabilize the concept of the name, labelled: "var. β, Musca sanio= sa Westring a. H." in Fallén's writing [verified by P. I. Persson]. The lectotype belongs to the species currently known as *Borborillus vitripennis* (Meigen). The description of *Musca saniosa* was apparently based on a mix of at least two species. The larvae, found in a woman's leg wound in Sweden, are clearly not Sphaeroceridae if Westring's illustrations are at all accurate, and based on the biology, they were probably Calliphoridae. Westring tried to rear them in horse dung, from which adults, probably Sphaeroceridae, emerged. This was Westring's only entomological publication and the whereabouts of his specimens is unknown (P. I. Persson, in litt.). Under *Copromyza equina*, Fallén (1820: 7) briefly described varieties β and γ of which the latter was said to be *Musca saniosa* Westring. Zetterstedt (1847: 2486), based on examination of Fallén's "specimina typica" (presumably the female here designated as lectotype), treated Fallén's var. γ under *vitripennis* (Meigen). There is no clear information to indicate that the lectotype, the only specimen with a *saniosa* label in Fallén's Collection (NHMS), originated from Westring or that it is a valid syntype, but considering that Fallén and Westring were contemporaries, it is possible and here assumed. Certain aspects of Westring's illustrations of the adult, such as the location of crossvein r-m and lack of a spur on the hind tibia, do not agree with this interpretation, but these may be simply errors in the drawings; other characters (e.g., hind tarsus with only 3 tarsomeres) are clearly inaccuracies. Lacking other evidence, it seems best to accept the synonymy of Fallén and Zetterstedt. To my knowledge, the name *saniosa* Westring has not been used as a valid name since the 1800's and is here considered a *nomen oblitum* (ICZN, 1999: Art. 23.9.2). It was cataloged by Papp (1984: 107) as a *nomen dubium* and listed by Thompson & Pont (1994: 117) as a Sphaeroceridae without further identification. *Borborillus vitripennis* (Meigen) has been used as a valid name (in various combinations) in at least 26 publications by 15 authors between 1955-2000 and therefore meets the requirements of Art. 23.9.1 to be considered a *nomen protectum*. These publications are: Carles-Tolrá, 1990a: 34, 1990b: 214; Florén, 1989: 4; Hackman, 1965b: 44, 1980: 147; Hayashi, 1986a: 196; Kuznetzova, 1987a: 62, 1987b: 78, 1989b: 76; Laurence, 1955a: 188; Lyneborg, 1968: 4; Marshall & Norrbom, 1993: 151; Munari, 1988a: 57; Munari et al., 1997: 252; Nishijima & Yamazaki, 1984: 79, Norrbom, 1987: 49; Papp, 1979c: 220, 1983b: 253, 1984: 76, 1985a: 493, 1988a: 393, 1990a: 108; Pitkin, 1988: 31; Roháček, 1987b: 246, 1994a: 7; Tsankova, 1987: 64.

spinifer Vanschuytbroeck, 1948: 36 *Borborus (Gymnometopina)*.

Lectotype male (MRAC); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "Congo Belge, Parc National Albert, riv. Bishakishaki - Kamatembe, "plaine de lave, 2100 m., 7-23.I.1935, G. F. de Witte"; "Holotype Borborus (Gymnometopina) spinifer Vanschuytbroeck". The lectotype belongs to the species currently known as *Metaborborus spinifer* (Vanschuytbroeck) (see Norrbom & Kim, 1985d: 38). Although Vanschuytbroeck labelled this specimen as holotype, it was not designated as such in the original description, and the use of this term by Norrbom & Kim (1985d: 38) is invalid. Because the type series contains a mix of species, the above male is designated as lectotype to maintain the current usage of this name.

stercorarius Meigen 1830: 202 *Borborus*.

Lectotype male (MNHN); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: [circular white accession label added by MNHN] "meigen" on one

side, "2847, 40" on other; "Borborus stercorarius ♂" in Meigen's writing; [red; added by Norrbom] "Lectotype Borborus stercorarius Meigen". The lectotype belongs to the species currently known as *Copromyza stercoraria* (Meigen) (see Norrbom & Kim, 1985b: 336). A female of *Lotophila atra* (Meigen) (doubtfully a paralectotype) is with the lectotype in the Meigen Collection under No. 2647. The present concept of this species does not match Meigen's illustration of *B. stercorarius* (see Morge, 1976, pl. CCLXXIX, 12) in that the frons is not so extensively orange, especially laterally (the orange area is usually semicircular, less commonly M-shaped) and the basal cubital cell is present. As this species was drawn on a different plate than the other Sphaeroceridae species, perhaps Meigen's drawing erred on these details. Given that Meigen's statement "Auf Dünger nicht selten" [on dung not rare] indicates that he saw multiple specimens, and that the lectotype has a Meigen label, it seems reasonable to consider it a valid syntype, and it is designated to preserve the current usage of this name. Meigen provided no type locality, but his statement about the habits of this species suggests that he collected the lectotype himself in the area of Stolberg, Germany.

tropicus Duda, 1923: 86 *Borborus (Borborillus) sordidus* var.

Lectotype male (HNHM); here designated by A. L. Norrbom to stabilize the concept of the name, labelled (according to Papp, 1988a: 400): "India or., Biró 1902"; "Matheran 800 m., VII.8"; "sordida ♂ det. O. Duda". The lectotype is the male designated as holotype of *Norrbomia indica* Papp, 1988a: 399. Duda described this taxon as a variety of *sordida* Zetterstedt based on numerous specimens ("Zahlreiche Exemplare") of both sexes from the HNHM collection from Ethiopia and East India (he gave no locality data except "Abyssinien und Ostindien"). He contrasted these exotic specimens of the new variety with Eurasian specimens of *sordida*. There are no specimens from Ethiopia or India labelled as *sordidus* or *tropicus* in the ZMHB collection where Duda's collection is deposited, and apparently none in the HNHM collection labelled as *tropicus*, but there are two series in the HNHM labelled by Duda as *sordidus* that should be considered *tropicus* syntypes, because Duda did not report the nominal variety from India or Ethiopia. A series of 19 males and females from India (all labelled similar to the lectotype and determined by Duda as *sordidus*) was described by Papp (1988a) as *Norrbomia indica*, and a series of 10 males and females from Ethiopia (labelled "Abyssinia, Kovács", "Dire-Daua, 1911, II.19", and "sordida ♂ det. O. Duda") was included in the type series of *Norrbomia demeteri* Papp (1988a: 395). The name *tropicus* has been considered a synonym of *Norrbomia marginatis* (Adams) (Richards 1980: 616), but based only on Richards (1962a: 365) interpretation of the original description. Duda distinguished *tropicus* from *N. marginatis* (as *B. marmoratus*) based on the length of the setulae of the hind tibia, which does appear to be a subtle, but diagnostic difference between these two species. These two species are more easily distinguished by the height of the densely microtrichose area on the gena. Because the type series includes a mix of two species, both subsequently described by Papp, the lectotype is here designated to fix the usage of this name.

umbripennis Zetterstedt 1847: 2482 *Copromyza*.

This name was published in synonymy of *C. fuscipennis* Zetterstedt and has not been validated. A male syntype in the Diptera Scandinavia Collection (MZLU) is *Crumomyia fimetaria* (Meigen). It is labelled: "139"; and "C. umbripennis ♂ Staeg." in Zetterstedt's writing.

unicolor Becker, 1908a: 134 *Borborus*.

Lectotype male (ZMHB); here designated by A. L. Norrbom to stabilize the concept of the name, labelled: "Guimar 47324. III"; “unicolor Beck [Becker’s writing] det. Becker”; “costalis det Duda” [Duda’s writing]; "LECTOTYPE ♂ Borborus unicolor Becker by Norrbom". This name has been considered a synonym of *Norrbomia costalis* (Zetterstedt) (see Papp, 1984, presumably based on the possible synonymy by Duda, 1938), but the

lectotype belongs to a different species for which *N. unicolor* appears to be the valid name. It differs from *N. costalis* especially in the shape of the cercus and paramere. It may be endemic to the Canary Islands. Becker did not state the number of male specimens he examined, so the single putative male type found in the ZMHB is here considered a syntype and designated as lectotype. Its labels fit the data provided by Becker "Von Guimar auf Teneriffe im März."

uncinatus Duda 1923: 77 *Borborus (Borborillus).*

Lectotype male (ZMHB); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: [orange] "3.4.16"; "Herten Westf. Duda"; "B. uncinatus D. ♂" in Duda's writing; "LECTOTYPE ♂ Borborus uncinatus Duda desig. Norrbom 2001". The lectotype belongs to the species currently known as *Borborillus uncinatus* (Duda), which can be recognized from other European Copromyzinae by its chaetotaxy (e.g., single row of postocular setae; 2 postpronotal setae). Duda described this species from multiple specimens from a variety of localities and institutions. The only specimen of *uncinatus* in the ZMHB marked as a type is a male of *uncinatus* labelled "Norwegen 7.35742" [Becker Collection style label], "hamatus m. d. Duda" in Duda's writing, [red] "Typus", which is presumably the male from Becker's Collection from Norway listed by Duda. Because Duda also stated that he collected specimens himself at Herten, all of the specimens he collected there prior to 1923 that bear his identification labels should be considered valid type material. There are at least 9 paralectotypes from Herten in the ZMHB (2 sent in exchange to USNM).

varipes Meigen 1830: 202 *Borborus*.

Lectotype male (MNHN); here designated by A. L. Norrbom to stabilize the current of the name, labelled: [circular white accession label added by MNHN] "meigen" on one side, "2850, 40" on other; "varipes" in Meigen's writing; [red; added by Norrbom] "Lectotype Borborus varipes Meigen". The lectotype belongs to the species currently known as *Crumomyia nigra* (Meigen) (see Norrbom & Kim, 1985a: 200). Another male of *C. nigra* and a female of *Lotophila atra* (Meigen) are with the lectotype in the Meigen Collection under No. 2650. All three specimens are teneral as reported by Séguy (1934). This name has been treated as a synonym of various species. Becker (1902) reported seeing under this name in the Meigen Collection a female "typische bezettelte Exemplar" [apparently meaning a specimen labelled by Meigen, although the specimen currently with Meigen's label is a male] similar to *Borborillus vitripennis* (Meigen), along with unlabelled specimens of *Copromyza equina* Fallén and *Crumomyia nigra*. Séguy (1934) synonymized *varipes* with *C. nigra*. Duda (1923, 1938) instead considered *varipes* a synonym of *Copromyza stercoraria*. None of the above species except *B. vitripennis* match Meigen's illustration of *B. varipes* (see Morge, 1976, pl. CLXIII, 7) in having crossvein r-m so close to the base of cell dm. But as noted by Duda (1923), none of the European Copromyzinae that have this character (*Borborillus* and *Norrbomia* spp. only) are as large as Meigen indicated in the description of *varipes* (1.5 lines), nor did Meigen include this character in the *varipes* description as he did in that of *B. vitripennis*. These discrepancies indicate that there was an error concerning either the description or the figure or, more likely, that Meigen's specimens were a mix of species. Meigen's statement "Im Frühlinge ziemlich gemein auf Dünger" [in Spring fairly common on dung] indicates that he saw multiple specimens and that he probably collected the lectotype himself in the area of Stolberg, Germany. So that this name should not be applied, based on Meigen's illustration, to any of the more recently named species of *Borborillus* or *Norrbomia*, I designate the above male as lectotype, which validates Séguy's (1934) synonymy of *varipes* with *C. nigra*.

vitripennis Meigen 1830: 206 *Borborus*.

Lectotype male (NHMW); here designated by A. L. Norrbom to stabilize the current concept of the name, labelled: "vitripennis" in Meigen's writing; "vitripennis Coll. Winth." [added by

NHMW workers]; "Lectotype ♂ Borborus vitripennis Meigen by Norrbom 2001". The lectotype belongs to the species currently known as *Borborillus vitripennis* (Meigen) (sensu Duda, 1923). A female of *Norrbomia costalis* (Zetterstedt) in the Meigen Collection (MNHN) under No. 2651 is here considered a paralectotype. It is labelled with: [circular white accession label added by MNHN] "meigen" on one side, "2851, 40" on other; "Borborus vitripennis" [in Meigen's writing]; and "Paralectotype ♀ Borborus vitripennis Meigen desig. Norrbom". Both specimens fit Meigen's description and illustration (see Morge, 1976, pl. CLXIII, 8) of *vitripennis* in having crossvein r-m near the base of cell dm. The lectotype is designated to preserve the prevailing usage of this name since Duda (1923) and to conserve the younger name *costalis* Zetterstedt as the valid name for a species of *Norrbomia*. Meigen's description did not include the type locality, but his statement that *vitripennis* was rare ("Selten"), suggest that he collected the lectotype himself in the area of Stolberg, Germany.

LIMOSININAE

dolorosa Williston, 1896: 432 *Limosina*.

Lectotype female (AMNH), here designated by M. Buck to clarify the generic placement and concept of the species, labelled: "Lim. dolorosa Will.", "May", "Type / No. / A.M.N.H.", "Am. Mus. Nat. Hist. / Dept. Invert. Zool. / No. 20344". Despite the "Type" label (which was obviously attached later by museum staff) the lectotype cannot be considered a holotype, because Williston, 1896 did not designate holotypes and just mentioned "numerous specimens". The type locality (not stated on the labels) is undoubtedly St. Vincent (West Indies) as stated in the original description. The lectotype belongs to the species that was subsequently described as *Rachispoda luciana* Wheeler in Wheeler & Marshall, 1995. The BMNH has four female paralectotypes (labelled identically: "Windward side / St. Vincent, W. I. / H.H. Smith", "W. Indies / 1907-66", "Cotype"), only two of which are conspecific with the lectotype. The other two specimens belong to the species presently known as *Rachispoda m-nigrum* (Malloch, 1912) and *Leptocera erythrocera* (Becker, 1920). Richards, 1961b: 563 first mentioned that the type series was mixed and consisted of species belonging to two subgenera (now considered genera). He did not designate a lectotype and kept *dolorosa* Williston in *Leptocera* (s.str.) (cf. Richards, 1967b: 8) which has been followed by subsequent authors. However, the only species in the type series that agrees with Williston's original description ("Scutellum ... margin reddish") is the one represented by the lectotype, a species of *Rachispoda* identical with *R. luciana* Wheeler.

ornata de Meijere, 1914: 270 *Limosina*. (nec *Limosina ornata* de Meijere, 1908: 177).

Lectotype female (ZMAM), here designated by J. Roháček to stabilize concept of the name and generic placement of the species, labelled: "E. Jacobson, Batavia, Nov 1908", "Limosina ornata det de Meijere. Type" [partly handwriten by de Meijere], "Limosina ornata de Meijere, 1914, ZMAN type DIPT.0890.1" [red label], "Limosina ornata de Meijere, 1914, J. Roháček des. 2001, ♀ Lectotypus" [red label], "Rachispoda quadrilineata (de Meijere, 1918) = L. ornata de Meijere, 1914, ♀ J. Roháček det. 2001". Present status: *Rachispoda quadrilineata* (de Meijere, 1918).

Taxa excluded from Sphaeroceridae

Genera

Bacchis Robineau-Desvoidy, 1830: 803 (feminine). Type species: *Bacchis cellarum* Robineau-Desvoidy, 1830, subsequent designation by Coquillett, 1910: 513. - Becker, 1905: 30 [in

Sphaeroceridae, as synonym of *Limosina*]; Duda, 1938: 15 [possibly **Drosophilidae**]. **Note:** Duda (1938: 15) apparently correctly associated the type species of this genus, viz. *Bacchis cellarum*, with Drosophilidae because it occurred on "corrupted wine" (see Robineau-Desvoidy, 1830: 804).

Borboroides Malloch, 1925c: 85 (masculine). Type species: *Borboroides atra* Malloch, 1925, original designation. - Hennig, 1973: 64 [in Sphaeroceridae]; Richards, 1973: 396 [transferred to **Heleomyzidae**]; D. K. McAlpine, 1985: 210 [diagnosis, affiliation to Heleomyzidae confirmed].

Cenchridobia Schiner, 1862: 435 (feminine). Type species: *Cenchridobia eggeri* Schiner, 1862, monotypy. - Schiner, 1864a: 334 [in Sphaeroceridae (as Borborinae); diagnosis]; Becker, 1905: 36 [in Sphaeroceridae (as Borboridae); Palaearctic catalog]. Collin, 1911: 138 [synonymy with *Carnus* Nitzsch, 1818, **Carnidae** (as Milichiidae)].

Coelopa Meigen, 1830: 8 (feminine). Type species: *Musca frigida* Fabricius, 1805 (misidentification = *Coelopa pilipes* Haliday, 1838), monotypy. - Stenhammar, 1855: 291-295, 317-323 [in Sphaeroceridae (as Copromyzinae); redescription]; Schiner, 1864a: 319 [in Sphaeroceridae (as Borborinae); diagnosis]; Becker, 1905: 22 [transferred to Phycodromidae = Coelopidae]; Hendel, 1910a: 112 [transferred to **Coelopidae** (as Coelopinae)].

Colocasiomyia de Meijere, 1914: 272 (feminine). Type species: *Colocasiomyia* de Meijere, 1914, monotypy. - Duda, 1938: 3 [as *Colocasia* /misspelling/; transferred to **Drosophilidae**].

Cotamba F. Walker, 1861: 246 (feminine). Type species: *Cotamba fumifera* Walker, 1861, monotypy. - Hackman, 1969a: 196 [uncertain family placement]; Hennig, 1973: 64 [in Sphaeroceridae]; Richards, 1973: 396 [possible sphaerocerid but description is inadequate and type is lost]; N. L. Evenhuis, 1989: 612 [unplaced genus of Acalyptratae]. The large size, pilose body and dorsally flattened head indicate that the genus most probably belongs to **Coelopidae**.

Cypselosoma Hendel, 1913: 105 (neuter). Type species: *Cypselosoma gephyrae* Hendel, 1913, monotypy. - Hendel, 1931: 5 [in Sphaeroceridae (as Cypselidae), subfamily Cypselosominae Hendel, 1931]; Duda, 1938: 3 [excluded from Sphaeroceridae]; Hennig, 1958: 551 [transferred to **Cypselosomatidae**].

Fiebrigella Duda, 1921: 123 (feminine). Type species: *Fiebrigella verrucosa* Duda, 1921, monotypy. - Duda, 1938: 3 [probably Chloropidae]; Hennig, 1958: 651 [probably Chloropidae]; Richards, 1967b: 2 [in Sphaeroceridae; Neotropical catalog]; Hackman 1969a: 206 [probably not Sphaeroceridae]; Sabrosky, 1970: 182 [transferred to **Chloropidae**].

Lipotherina de Meijere, 1914: 271 (feminine). Type species: *Lipotherina flavinotata* de Meijere, 1914, monotypy. - de Meijere, 1918: 324 [synonymy with *Cypselosoma* Hendel, 1913]; Hennig, 1958: 554 [synonymy with *Cypselosoma* Hendel, 1913, **Cypselosomatidae**].

Neoborborus Rayment, 1931: 189 (masculine). Type species: *Neoborborus speculabundus* Rayment, 1931, monotypy. - Rayment, 1932: 41 [synonymy with *Ephydroscinis* Curran, 1930; **Chloropidae**]; Richards, 1973: 396 [Chloropidae].

Olina Robineau-Desvoidy, 1830: 812 (feminine). Type species: *Olina hirtipes* Robineau-Desvoidy, 1830, subsequent designation by Coquillett, 1910: 579. - Becker, 1905: 27 [in Sphaeroceridae, Palaearctic catalog]; Duda, 1938: 16 [not Sphaeroceridae]; Papp, 1984: 105 [doubtful genus, probably of Heleomyzidae]. **Note:** The large size, body colour, hairy legs and little swollen hind basitarsus of the type species preclude the genus to belong to Sphaeroceridae. We agree with Papp (1984: 105) that it (probably with all species included) should be transferred to **Heleomyzidae**.

Platyborborus de Meijere, 1914: 273 (masculine). Type species: *Platyborborus crassipes* de Meijere, 1914, monotypy. - Grimaldi, 1992: 419 [synonymy with *Colocasiomyia*, **Drosophilidae**].

Protoborborus Malloch, 1933: 261 (masculine). Type species: *Protoborborus neozelandicus* Malloch, 1933, monotypy. - Harrison, 1959: 254-255 [redescription, in Sphaeroceridae]; D. K. McAlpine, 1966: 682 [synonymy with *Pseudopomyza* Strobl, 1893, in **Pseudopomyzidae**]; Richards, 1973: 396 [Pseudopomyzidae].

Sphinctomyia Borgmeier, 1954: 294 (feminine). Type species: *Sphinctomyia aenigmatica* Borgmeier, 1954, original designation. - Steyskal, 1971a: 376-377 [transferred to Sphaeroceridae]. **Note:** Recent re-examination (S. A. Marshall, J. Roháček) of the holotype of *Sphinctomyia aenigmatica* revealed that Steyskal (1971a) was incorrect to transfer the genus *Sphinctomyia* to Sphaeroceridae. This genus clearly belongs to the alliance of **Phoridae, Sciadoceridae** and/or **Platypezidae** as Borgmeier (1954) originally suggested. It has nothing in common with acalyptrate Diptera (cf. chaetotaxies of head, thorax and hind tarsus - Borgmeier, 1954: Figs 2-7 and structure of female postabdomen - Steyskal, 1971a: Fig.1).

Tendeba F. Walker, 1865: 117 (feminine). Type species: *Tendeba testacea* Walker, 1865, monotypy. - Hackman, 1969a: 196 [uncertain family placement]; Hennig, 1973: 64 [in Sphaeroceridae]; Richards, 1973: 396 [probably not a member of Sphaeroceridae]; N. L. Evenhuis, 1989: 612 [unplaced genus of Acalyptratae].

Therina Meigen, 1830: 197 (feminine). Type species: *Therina femoralis* Meigen, 1830, monotypy. - Schiner, 1864a: 320 [in Sphaeroceridae (as Borborinae); diagnosis]; Becker, 1905: 26 [in Sphaeroceridae (as Borborinae); Palaearctic catalog]. Duda, 1938: 2 [not Sphaeroceridae, possibly Agromyzidae]. **Notes:** The type species surely is not representative of Sphaeroceridae but whereabout it belongs is unknown. Judging from Meigen's figures (published by Morge, 1976b: Pl. 276, Figs 19a-c) it could perhaps be associated with **Trixoscelididae**. The genus *Therina* Meigen, 1830 was not mentioned in the catalogue of Palaearctic Diptera (Papp, 1984).

Therinopsis Vimmer, 1939: 64 (feminine). Type species: *Therinopsis richardsi* Vimmer, 1939, monotypy. - Chvála & Kovalev, 1987: 61 [synonymy with *Crossopalpus* Bigot, 1857; **Hybotidae:** Tachydromiinae]. **Note:** Vimmer (1939: 64) established for his genus *Therinopsis* a new subfamily Therinopsidinae which was synonymized with Tachydromyiinae by Chvála & Kovalev (1987: 61). The genus *Therinopsis* Vimmer, 1939 was not mentioned in the catalogue of Palaearctic Diptera (Papp, 1984).

Species

aenigmatica Borgmeier, 1954: 295 *Sphinctomyia* [female, illustr.]. Type locality: Brasil, Santa Catarina, Nova Teutônia. HT female (USNM). - Steyskal, 1971a: 376-377 [in Sphaeroceridae; female abdomen, illustr.]. **Note**: The species belongs to **Phoridae, Sciadoceridae** and/or **Platypezidae** (see above under *Sphinctomyia*).

agilis Contarini, 1847: 191 *Sphaerocera* [sex not stated]. Type locality: Italy, Venezia. STs, sex not given (depository unknown). A number of characters given in the original description indicate that the species belong to **Phoridae** and, consequently, it is excluded from Sphaeroceridae here.

ater Malloch, 1925c: 85 *Borboroides* [as *B. atra*; female, illustr.]. Type locality: Australia, New South Wales, Sydney. Holotype female (? AMSA). - Richards, 1973: 396 [transferred to **Heleomyzidae**].

capensis Robineau-Desvoidy, 1830: 812 *Olina* [sex not stated]. Type locality: South Africa, cap de Bonne-Espérance [= the Cape of Good Hope]. STs, sex unknown (not found in MNHN, ? lost). **Note:** A doubtful species, probably belonging to **Heleomyzidae**.

cellarum Robineau-Desvoidy, 1830: 804 *Bacchis* [sex not stated]. Type locality: not given (? France). STs, sex unknown (not found in MNHN, ? lost). - Becker, 1905: 30 [as *Limosina*, Palae-arctic catalog]; Duda, 1938: 15 [possibly Drosophilidae]. **Note:** Unrecognizable species of **Drosophilidae**.

clavipes Robineau-Desvoidy, 1830: 812 *Olina* [sex not stated]. Type locality: Iles Malouines. STs, sex unknown (not found in MNHN, ? lost). **Note:** A doubtful species, probably belonging to **Heleomyzidae**.

crassipes de Meijere, 1914: 273 *Platyborborus* [male]. Type locality: Java, Semarang. HT male (ZMAN, see de Jong, 2000: 58). - Grimaldi, 1992: 419 [transferred to *Colocasiomyia*, **Drosophilidae**].

cristata de Meijere, 1914: 273 *Colocasiomyia* [sex not stated]. Type locality: Java, Nongkodjadjar. STs, both sexes (ZMAM, see de Jong, 2000: 59). - Duda, 1838: 3 [as *Colocasia* /misspelling/, genus *Colocasiomyia* and, consequently, also its type species transferred to **Drosophilidae**].

eggeri Schiner, 1862: 436 *Cenchridobia* [both sexes]. Type locality: Austria. STs, both sexes (NHMW). - Schiner, 1864a: 335 [in Sphaeroceridae (as Borborinae); diagnosis]; Becker, 1905: 36 [in Sphaeroceridae (as Borboridae); Palaearctic catalog]; Collin, 1911: 138 [synonymy with *Carnus hemapterus* Nitzsch, 1818, **Carnidae** (as Milichiidae)].

femoralis Meigen, 1830: 197 *Therina* [sex not stated]. Type locality not given. STs, number and sex unknown (not found in MNHN or NHMW, probably lost). Becker, 1905: 26 [in Sphaeroceridae (as Borborinae); Palaearctic catalog]. **Note:** This subsequently unrecognized species most probably belongs to **Trixoscelididae**.

flavinotata de Meijere, 1914: 271 *Lipotherina* [female, illustr.]. Type locality: Java, Nongkodjadjar. HT female (ZMAM, see de Jong, 2000: 76). - de Meijere, 1918: 324 [synonymy with *Cypselosoma gephyrae* Hendel, 1913]; Hennig, 1958: 554 [synonymy with *Cypselosoma gephyrae*, **Cypselosomatidae**].

frigida Fabricius, 1805: 307 *Musca* [sex ?]. Type locality: Norway, Lappland. STs, sex ? (? ZMUC). - Meigen, 1830: 8 [transferred to *Coelopa* Meigen]; Schiner, 1864a: 319 [in Sphaeroceridae (as Borborinae); diagnosis]; Hendel, 1910a: 112 [transferred to **Coelopidae** (as Coelopinae)].

fumifera F. Walker, 1861: 246 *Cotamba* [male]. Type locality: Indonesia, New Guinea (Irian Jaya), Dorey [=Manokwari]. ST(s) males (not found in BMNH, ? lost). - N. L. Evenhuis, 1989: 612 [unplaced species of Acalyptratae]. The large size, pilose body and dorsally flattened head indicate that the species most probably belongs to **Coelopidae**.

gephyrae Hendel, 1913: 105 *Cypselosoma* [male, illustr.]. Type localities: Formosa, Hoozan; Formosa, Tappani. STs, males (ZMHB). - Hennig, 1958: 551 [transferred to **Cypselosomatidae**].

hirtipes Robineau-Desvoidy, 1830: 812 *Olina* [sex not stated]. Type locality: France, Paris. STs, sex unknown (not found in MNHN, ? lost). - Becker, 1905: 27 [in Sphaeroceridae; Palaearctic catalog]; Papp, 1984: 106 [unrecognizable species, probably of **Heleomyzidae**].

neozelandicus Malloch, 1933: 262 *Protoborborus* [both sexes, illustr.]. Type locality: New Zealand, Wanganui. HT female (BMNH). - D. K. McAlpine, 1966: 682 [transferred to *Pseudopomyza,* **Pseudopomyzidae**].

nigra Gimmerthal, 1834: 115 *Therina* [sex not stated]. Type locality: not given. ST(s), sex unknown (? NMRL). - Becker, 1905: 26 [in Sphaeroceridae; Palaearctic catalog]. **Note:** This

unrecognizable species surely does not belong to Sphaeroceridae (it has slender hind basitarsus and black abdomen with greenish-blue shine) but its family placement is unknown.

nudipes Robineau-Desvoidy, 1830: 813 *Olina* [sex not stated]. Type locality: France, Paris. STs, sex unknown (not found in MNHN, ? lost). - Becker, 1905: 27 [in Sphaeroceridae; Palaearctic catalog]; Papp, 1984: 106 [doubtful species of Sphaeroceridae]. **Note:** An unrecognizable species, perhaps belonging to **Heleomyzidae**.

pallipes Robineau-Desvoidy, 1830: 813 *Olina* [sex not stated]. Type locality: France, Paris. STs, sex unknown (not found in MNHN, ? lost). - Becker, 1905: 27 [in Sphaeroceridae; Palaearctic catalog]. **Note:** A doubtful species, probably belonging to **Heleomyzidae**.

pilipes Haliday, 1838: 186 *Coelopa* [sex ?]. Type locality: not stated. STs, sex ? (? NMID). - Schiner, 1864a: 320 [in Sphaeroceridae (as Borborinae)]; Hendel, 1910a: 112 [transferred to **Coelopidae** (as Coelopinae)].

richardsi Vimmer, 1939: 64 *Therinopsis* [female, illustr.]. Type locality: Czech Republic, Silesia, vicinity of Opava. HT female (NMPC). - Chvála & Kovalev, 1987: 61 [synonymy with *Crossopalpus humilis* Frey, 1913; **Hybotidae**].

†***sepultula*** Cockerell, 1915: 497 *Sphaerocera*. [sex unknown; Oligocene compression fossil; wing fragment illustr.]. Type locality: England, Gurnet Bay. HT, sex unknown (USNM). - Richards, 1930: 333 [probably not Sphaeroceridae, it more likely belongs to Agromyzidae]; N. L. Evenhuis, 1994: 440 [in Sphaeroceridae; catalog of fossil flies]. **Notes:** The species certainly does not belong to the genus *Sphaerocera* [cf. also Richards, 1930: 333] and its placement to Sphaeroceridae is very doubtful (cf. Marshall et al. 1999). Because of the shape of R_{2+3} on wing (cf. Cockerell, 1915: Pl. 63, Fig. 3) *S. sepultula* is excluded here from Sphaeroceridae but its correct affiliation has not been established.

speculabundus Rayment, 1931: 191 *Neoborborus* [male, illustr.]. Type locality: Australia, Sandringham, Port Philip. HT male (MVMA). - Rayment, 1932: 41 [synonymy with *Ephydroscinis raymenti* Curran, 1930; **Chloropidae**].

subcinerea Brullé, 1832: 319 *Sphaerocera* [female]. Type locality: Greece, Morée. ST(s) female (depository unknown). **Note:** This doubtful species apparently does not belong to Sphaeroceridae. According to the original description its head and thorax are black with violet shine and its wing venation resembles those of "division *e* of the genus *Borborus* Meigen" (= Limosininae). No species of known Sphaeroceridae has such colour and, therefore, it is excluded here from the family. However, its correct family placement is unknown.

testacea F. Walker, 1865: 118 *Tendeba* [male]. Type locality: "New Guinea". ST(s) males (not found in BMNH, ? lost). - N. L. Evenhuis, 1989: 612 [unplaced species of Acalyptratae].

transversalis Malloch, 1919: 53 *Leptocera* [female]. Type locality: USA, Alaska, pond at Collinson Point. STs, females (CMNC). – Duda, 1925: 208 [species unplaced to genus]; Spuler, 1925c: 162 [possibly a Chloropidae]; Sabrosky, 1965: 791 [synonymy with *Lasiosina approximatonervis* (Zetterstedt, 1848) as var. *transversalis* Malloch, 1919; **Chloropidae**].

verrucosa Duda, 1921: 143 *Fiebrigella* [female]. Type locality: Paraguay, San Bernardino. HT [apparently a male, see Sabrosky, 1970: 183] (ZMHB). - Richards, 1967b: 2 [in Sphaeroceridae; Neotropical catalog]; Sabrosky, 1970: 182-183 [transferred to **Chloropidae**].

ursina Wiedemann, 1824: 59 *Copromyza* [sex not stated]. Type locality: South Africa, "Kap" [Cape of Good Hope]. STs, both sexes (ZMUC, NHMW). The syntypes in ZMUC are a species of *Coelopa* Meigen (**Coelopidae**).