

# THE FAMILY-GROUP NAMES OF THE SCALE INSECTS (HEMIPTERA : COCCOIDEA)

BY

DOUGLAS JOHN WILLIAMS

Commonwealth Institute of Entomology, London

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# THE FAMILY-GROUP NAMES OF THE SCALE INSECTS (HEMIPTERA : COCCOIDEA)

By D. J. WILLIAMS

## SYNOPSIS

This catalogue of family-group names of the Coccoidea contains all categories from super-family to subtribe with their earliest date of use. It is arranged alphabetically under the type-genera of the family-group names. A separate list follows containing group names not based on nominal genera.

## INTRODUCTION

THIS work lists all family-group names in the Coccoidea with their different categories. The list, in catalogue form, is arranged alphabetically under the type-genera of the family-group names. There exist over 100 of these names based on nominal genera and in many cases their use has been quite arbitrary. It is hoped that, when proposing new group names, workers may ascertain from the list whether a name is available already, based on the nominal genus, or on a near-related genus.

The first group name formed from the genus *Coccus* was, apparently, *Coccides* proposed by Fallén (1814). It was not until 1868 that an attempt was made to classify the group when Targioni-Tozzetti used the tribal names *Orthezites*, *Coccites*, *Lecanites* and *Diaspites*. These tribes form the bases of the major groups today.

Scale insect classification has been based almost entirely on adult females. It is doubtful whether any but a few species can be identified from adult males. Mature females are, nevertheless, larval in form and are truly neotenic. All known males pass through two so-called pupal stages, emerging as winged or wingless adults. The winged form is the more common but most of the wingless males are degenerate and have reverted to larviform characters. These are not neotenic males in the strict sense. Maturity through pupal stages would prevent the use of this term.

The supposed loss of the pupal stages in the female has resulted in insects widely divergent in shape and size. So different is their appearance that it is remarkable how Réaumur and Linnaeus correctly placed them in the same group at such an early date. The wide difference in shape has led many recent workers to regard scale insects as forming a suborder. If adult male characters had been used from the beginning instead, then probably no category higher than a family would have been recognized for the whole group.

Special studies in cytology mainly by F. Schrader from 1921-44, S. Hughes-Schrader from 1925, S. W. Brown from 1957 and special work on symbionts by P. Buchner mainly from 1954 have helped to clarify many problems in the classification of scale insects.

Balachowsky (1942) proposed three 'phyla', *Margaroidae*, *Lecanoïdae* and *Diaspidoïdae* for the Coccoidea. Despite the choice of name, these 'phyla' were based on the characters of three major groups of adult males. Subsequent studies of males by Theron (1958), Beardsley (1960, 1962), Ghauri (1962) and Giliomee (1967) have tended to confirm Balachowsky's classification.



Recent workers on the cytology of scale insects are also in accord with Balachowsky. Cytological studies of the group and studies of adult males are still in the pioneer stages. Nevertheless it is obvious that they will alter our concepts of the present classification. Before such changes take place, this seems a fitting time to take stock of the present family-group names and it is for this reason that the following list has been compiled. It has involved an extensive search through the literature, because many names are found in text-books and works not primarily concerned with scale insects. There may be many omissions therefore.

Coccid workers have often ignored the International Code of Zoological Nomenclature in their use of family-group names. The rules of priority pertain to these as much as to generic and specific taxa. Article 36 has rarely been followed. This applies to all categories in the family-group as being of co-ordinate status in nomenclature. Zoologists in general have usually accepted a family-group name formed from the stem of a genus. Article 13(a)(i) of the International Code of Zoological Nomenclature published in 1961 states that names proposed after 1930 should be 'accompanied by a statement that purports to give characters differentiating the taxon'. It is not clear from the 'Code' whether this ruling was definitely intended to invalidate family-group names without distinguishing characters but the ruling certainly stands. Some names published after 1930, without an indication, are accepted in this catalogue, because no ruling existed at the time of their publication.

#### CATALOGUE OF FAMILY-GROUP NAMES

##### **ACANTHOCOCCUS** Signoret, 1875.

ACANTHOCOCCITES Signoret, 1875*b* : 16.

ACANTHOCOCCARIA Signoret; Atkinson, 1886 : 286.

ACANTHO-COCCIDAE Signoret; Maskell, 1887 : 47.

ACANTHOCOCCIDAE Signoret; Maskell, 1887 : 88.

ACANTHOCOCCINI Signoret; Ashmead, 1891 : 95.

ACANTHOCOCCINAE Signoret; Maskell, 1894*b* : 84.

The validity of this group name depends on whether *Acanthococcus* is identical with *Eriococcus* Targioni-Tozzetti. The family name Eriococcidae, 1899 has been widely used in recent years but if Borchsenius (1948) is correct in recognizing *Acanthococcus* as distinct from *Eriococcus*, then *Acanthococcites* has priority over Eriococcidae. The acceptance of Acanthococcidae would also depend on whether the genus *Kermes* Boitard belongs to this group, in which case *Kermesites* Signoret, 1875 is available. It has page priority over *Acanthococcites*. Available evidence on the adult males suggests that *Kermes* may be distinct. For stability in the future it is suggested that the name Acanthococcidae be accepted.

##### **ACLERDA** Signoret, 1874.

ACLERDINI Cockerell, 1905*b* : 197.

ACLERDIDAE Cockerell; Ferris, 1937 : 6.

ACLERDI Cockerell; Silvestri, 1939 : 700.

ACLERDINAE Cockerell; Balachowsky, 1942 : 43.

The family status of this group is now widely accepted, McConnell (1954) having revised the entire group. It is, apparently, a link between the family Coccidae and the family Eriococcidae but a comprehensive study is needed of the adult males.



**ANCEPASPIS** Ferris, 1920.

ANCEPASPIDINI Borchsenius, 1965 : 366.

Ferris (1942) included the genus *Ancepaspis* in the subfamily Phoenicococcinae following Stickney (1934). Cytological studies by Brown & McKenzie (1962) showed that the genus has affinities with the Diaspididae. Borchsenius (1965) recognized the group as a tribe in the Diaspidinae, family Diaspididae.

**ANDASPIS** MacGillivray, 1921.

ANDASPIDINA Balachowsky, 1968 : 61.

Balachowsky placed this subtribe in the tribe Lepidosaphedini. It includes *Andaspis* MacGillivray, *Caia* Williams, *Metandaspis* Williams and *Parandaspis* Balachowsky. The genera *Raoaspis* Borchsenius, *Pararaoaspis* Borchsenius and *Roonwalaspis* Borchsenius should also be included.

**ANTAKASPIS** Mamet, 1959.

ANTAKASPIDINI Mamet, 1959a : 464.

Mamet proposed this name in the family Diaspididae. It comes close to the tribes Diaspidini and Odonaspidini. The group name was accepted by Borchsenius (1965) as one of six tribes within the subfamily Diaspidinae.

**ANTONINA** Signoret, 1875.

ANTONININI Borchsenius, 1949 : 44.

ANTONININAE Borchsenius; Bodenheimer, 1952 : 318.

It is doubtful whether this group name can be accepted. The genus *Antonina* in the family Pseudococcidae is very close to *Sphaerococcus* Maskell, included in the tribe Sphaerococcini by Cockerell (1899a). It is also related to *Serrolecanium* Shinji, 1935, placed in Serrolecaniinae by Shinji in the same paper. Both these group names have priority over Antoninini.

**AONIDIA** Targioni-Tozzetti, 1868.

AONIDINA Balachowsky, 1948b : 266.

AONIDIINA Balachowsky; Borchsenius, 1965 : 373.

Balachowsky placed this subtribe in the tribe Aspidiotini, family Diaspididae. Available evidence from Dr. M. S. K. Ghauri, who studied the adult males at the request of the writer, shows that the genus *Aonidia* is related to the pupillarial parlatoriine species.

**APIOMORPHA** Rübsaamen, 1894.

APIOMORPHINAE MacGillivray, 1921 : 45.

APIOMORPHINI MacGillivray; Handlirsch, 1925 : 1138.

APIOMORPHI MacGillivray; Silvestri, 1939 : 699.

APIOMORPHIDAE MacGillivray; Lizer y Trelles, 1939 : 176.

The group name replaced the invalid group name *Brachyscelides* Signoret, 1869, based on the preoccupied generic name *Brachyscelis* Schrader. *Apiomorpha* was included in the family Eriococcidae by Ferris (1957b) and by Hoy (1963). If this is generally accepted, the name *Apiomorpha* is available within the Eriococcidae.



**ASPIDIELLA** Leonardi, 1898.

ASPIDIELLINA Borchsenius, 1965 : 372.

This name was included by the author as a subtribe in the tribe Targionini, subfamily Aspidiotinae, family Diaspididae.

**ASPIDIOTUS** Bouché, 1833.

ASPIDIOTI Westwood, 1840 : 444.

ASPIDIOTARIA Westwood; Atkinson, 1886 : 271.

ASPIDIOTINI Westwood; Ashmead, 1891 : 101.

ASPIDIOTINAE Westwood; Brues & Melander, 1932 : 130.

ASPIDIOTEA Westwood; Thiem & Gerneck, 1934 : 230.

ASPIDIOTINA Westwood; Balachowsky, 1948b : 268.

ASPIDINAE Westwood; Bodenheimer, 1952 : 327.

The importance of this group gained prominence after Ferris (1936a, 1937, 1937a) accepted it as a tribe within the family Diaspididae. With slight modifications, the group is still recognized and some recent workers have accepted it with subfamily status with tribal and subtribal categories.

**ASTEROLECANIUM** Targioni-Tozzetti, 1868.

ASTEROLECANIINAE Cockerell, 1896b : 327.

ASTEROLECANIINI Cockerell; Cockerell, 1899m : 275.

ASTEROLECANIIDAE Cockerell; Enderlein, 1914 : 369.

ASTEROLECANI Cockerell; Silvestri, 1939 : 686.

ASTEROLECANINAE Cockerell; Balachowsky, 1948b : 251.

ASTEROLECANINI Cockerell; Balachowsky, 1948b : 256.

ASTEROLECANIDAE Cockerell; Bodenheimer, 1953 : 115.

This group is now well established and is widely recognized as having family status. A study is needed of some of its subdivisions. Borchsenius recognized the family Lecaniodiaspididae as being distinct but this needs to be verified from a study of the males.

**AUGULASPIS** MacGillivray, 1921.

AUGULASPIDINA Borchsenius, 1965 : 366.

Borchsenius erected this subtribe within the tribe Chionaspidini, subfamily Diaspidinae, family Diaspididae.

**AUSTROTACHARDIA** Chamberlin, 1923.

AUSTROTACHARDIINI Chamberlin, 1925 : 40.

AUSTROTACHARDININA [sic] Chamberlin; Balachowsky, 1950 : 9.

(A *lapsus* for AUSTROTACHARDINA).

This group is currently assigned to the family Lacciferidae.

**BEESONIA** Green, 1926.

BEESONIDAE Ferris, 1950 : 5.

BEESONII Ferris; Ferris, 1957b : 67.

BEESONIIDAE Ferris; Ferris, 1957b : 67.

Ferris erected the family for a single genus containing but two species. He later proposed the name Beesonii as a ramus within the superfamily Coccoidea. Despite the obvious peculiarities of the genus, it probably has close affinities with the family Diaspididae on the basis of the adult males and pupillarial females.



**BRACHYSCELIS** Schrader, 1863.

BRACHYSCELIDES Signoret, 1869a : 98.

BRACHYSCELIDAE Signoret; Maskell, 1879 : 189.

BRACHYSCELINAE Signoret; Comstock, 1881a : 427.

BRACHYSCELINES Signoret; Blanchard, 1883 : 232.

BRACHYSCELINA Signoret; Atkinson, 1886 : 268.

BRACHYSCELINI Signoret; Cockerell, 1899m : 275.

As the name *Brachyscelis* Schrader was preoccupied and replaced by *Apiomorpha* Rüb-saamen, likewise the group name was replaced by *Apiomorphinae* MacGillivray.

**CALLIPAPPUS** Guérin-Méneville, 1841.

CALLIPAPPINAE MacGillivray, 1921 : 53.

CALLIPAPPINI MacGillivray; Handlirsch, 1925 : 1136.

In his revision of the family Margarodidae, Morrison (1928) included the tribe within the subfamily Margarodinae, family Margarodidae.

**CALYCICOCCUS** Brain, 1918.

CALYCICOCCINAE Brain, 1918 : 111.

Brain assigned this subfamily to the Coccidae of the Fernald Catalogue, without indicating its relationships. Ferris (1957b) suggested that it belonged to the Eriococcidae and Hoy (1963) concurred. A study is needed of the type-species *Calycicoccus merwei* Brain. In the meantime the group name is available within the family Eriococcidae.

**CALYMMATA** O. G. Costa, 1828.

CALYMMATINAE Kirkaldy, 1904a : 258.

The name *Calymmata* is currently recognized as a synonym of *Coccus* Linnaeus and hence the group name must be regarded as a synonym of the family name Coccidae Fallén.

**CANCERASPIS** Hempel, 1934.

CANCERASPIDINAE Hempel, 1934 : 140.

CANCERASPIDIDAE Hempel; Costa Lima, 1936 : 161.

CANCERASPINAE Hempel; Ferris, 1937 : 7.

Although Hempel suggested that this group was related to the family Diaspididae, it is the writer's opinion, on the basis of the first stage larva, that it probably belongs to the family Eriococcidae.

**CEROCOCCUS** Comstock, 1882.

CEROCOCCINAE Balachowsky, 1942 : 44.

CEROCOCCINI Balachowsky; Balachowsky, 1948b : 256.

The genus *Cerococcus* has long been associated with the genus *Asterolecanium* and the group name is currently assigned to the family Asterolecaniidae. The adult males, however, show a close relationship to the family Eriococcidae.

**CEROPLASTES** Gray, 1828.

CEROPLASTARIA Maskell, 1887 : 276.

CEROPLASTINAE Maskell; Bodenheimer, 1952 : 317.

CEROPLASTIINAE Maskell; Bodenheimer, 1953a : 93.



This group was recognized by Borchsenius (1957) as a subfamily within the family Coccidae *sensu stricto*. Giliomee (1967) after studying adult males, decided that the genus *Ceroplastes* was very close to *Coccus*, in which case the subfamily name Ceroplastinae should probably be sunk as a synonym of Coccinae of the family Coccidae.

**CHIONASPIS** Signoret, 1869.

CHIONASPIDINAE Brues & Melander, 1932 : 130.  
 CHIONASPIFORMES Brues & Melander; Balachowsky, 1954e : 164.  
 CHIONASPIDINA Brues & Melander; Ghauri, 1962 : 199.  
 CHIONASPIDINI Brues & Melander; Borchsenius, 1965 : 364.

Ferris (1937) did not recognize this group and placed the type-genus in the tribe Diaspidini. Borchsenius (1965) recognized the subtribe Chionaspina and tribe Chionaspini in the subfamily Diaspidinae, family Diaspididae.

**CISSOCOCCUS** Cockerell, 1902.

CISSOCOCCINAE Brain, 1918 : 107.

When Cockerell described the genus *Cissococcus*, he placed it in the tribe Eriococcini. Some rather poor specimens examined in the collections of the British Museum (Natural History) support the views of Ferris (1920a) that it has close affinities with the genus *Ceroplastes*. The group is, therefore, currently assigned to the family Coccidae but a study of fresh material is needed.

**COCCOMYTILUS** Leonardi, 1898.

COCCOMYTILINA Borchsenius, 1965 : 365.

The author placed this subtribe in the tribe Lepidosaphidini of the subfamily Diaspidinae.

**COCCURA** Šulc, 1908.

COCCURINI Borchsenius, 1948a : 954.  
 This tribe was assigned to the family Pseudococcidae

**COCCUS** Linnaeus, 1758.

COCCIDES Fallén, 1814 : 23.  
 COCCIDAE Fallén; Samouelle, 1819 : 233.  
 COCCINA Fallén; Newman, 1834 : 380.  
 COCCITES Fallén; Newman, 1834 : 380.  
 COCCI Fallén; Westwood 1840 : 444.  
 COCCINIENS Fallén; Blanchard, 1840 : 210.  
 COCCINAE Fallén; Shimer, 1868 : 372.  
 COCCITI Fallén; Targioni-Tozzetti, 1868 : 710.  
 COCCINII Fallén; Chenu, 1875 : 15.  
 COCCINES Fallén; Blanchard, 1883 : 231.  
 COCCARIA Fallén; Atkinson, 1886 : 285.  
 COCCINI Fallén; Ashmead, 1891 : 95.  
 COCCIDINAE Fallén; Maskell, 1887 : 45.  
 COCCIDIDAE Fallén; Maskell, 1887a : 5.  
 COCCIDI Fallén; Acloque, 1897 : 407.  
 COCCOIDEA Fallén; Handlirsch 1903 : 738.  
 COCCIDA Fallén; Heymons, 1907 : 143.  
 COCCIDOIDES Fallén; Crampton, 1916 : 301.



COCCOPTERA Fallén; Krausse & Wolff, 1919 : 169.

COCCIDOIDEA Fallén; Ferris, *in* Chamberlin, 1923 : 163.

COCCODEA Fallén; Kiritchenko, 1928a : 145.

COCCIDOIDEAE Fallén; Seabra, 1930 : 269.

COCCINEA Fallén; Beier, 1938 : 2444.

It is now generally accepted that Fallén was the first to use the group name based on the nominal genus *Coccus*. Many later workers have credited the authorship to Leach but no reference has been found confirming this. Leach (1815 : 126) placed the genera *Dorthesia* and *Coccus* in the tribe Aphides of the family Aphida. He mentioned no group name formed from the genus *Coccus* and it is doubtful whether he published such a name earlier than Fallén's name in 1814.

The group name has been given many suffixes but the scale insects are currently regarded as forming the superfamily Coccoidea. The family Coccidae is restricted to those insects close to *Coccus hesperidum* L., the type-species.

**COELOSTOMIDIA** Cockerell, 1900.

COELOSTOMIDIINAE Morrison, 1927 : 102.

COELOSTOMIDIINI Morrison; Morrison, 1927 : 102.

Morrison placed this subfamily in the family Margarodidae.

**COMSTOCKIELLA** Cockerell, 1896.

COMSTOCKIELLINI Borchsenius, 1965 : 372.

This tribe is one of four included by Borchsenius in the subfamily Aspidiotinae, family Diaspididae. The name *Comstockiellina*, mentioned by Borchsenius (1965 : 372), is a *lapsus* for *Comstockiella*.

**CONCHASPIS** Cockerell, 1893.

CONCHASPINAE Green, 1896e : 17.

CONCHASPIDINAE Green; Green, 1900a : 66.

CONCHASPIDIDAE Green; Brues & Melander, 1932 : 131.

CONCHASPIDAE Green; Ferris, 1937 : 6.

CONCHASPINI Green; Silvestri, 1939 : 858.

The group is now widely recognized as a distinct family. It has been completely revised by Mamet (1954b).

**CRYPTOCOCCUS** Douglas, 1890.

CRYPTOCOCCIDAE Kosztarab, 1968 : 12.

The author erected this family for *Cryptococcus* Douglas, a genus widely accepted in the family Eriococcidae. It is not clear how it differs from the Eriococcidae but the name is available in this family under another category.

**CTENOCHITON** Maskell, 1879.

CTENOCHITONINI Cockerell, 1889n : 16.

The adult female of the type-species, *Ctenochiton viridis* Maskell, was redescribed by Morrison & Morrison (1922). There is need for a further study of this species, together with the adult male, to determine its relationships. The group name is available within the family Coccidae.



**CYLINDROCOCCUS** Maskell, 1892.

CYLINDROCOCCINAE MacGillivray, 1921 : 45.

CYLINDROCOCCINI MacGillivray; Handlirsch, 1925 : 1138.

CYLINDROCOCCIDAE MacGillivray; Brues &amp; Melander, 1932 : 134.

Ferris (1957*c*) placed this genus in the family Eriococcidae and this was accepted by Hoy (1963). If this action is generally accepted, the group name is available within the family.

**DACTYLOPIUS** O. G. Costa, 1835.DACTYLOPITES Signoret, 1875*b* : 305.

DACTYLOPARIA Signoret; Atkinson, 1886 : 285.

DACTYLOPIDAE Signoret; Maskell, 1877*a* : 89.

DACTYLOPINA Signoret; Crawford, 1890 : 76.

DACTYLOPIINI Signoret; Ashmead, 1891 : 95.

DACTYLOPINAE Signoret; Maskell, 1894*b* : 86.DACTYLOPIINAE Signoret; Green, 1896*e* : 17.

DACTYLOPIIDAE Signoret; Enderlein, 1914 : 370.

The type of the genus *Dactylopius*, fixed by Cockerell (1902*k* : 453, 454) as *D. coccus* Costa, the cochineal insect of commerce, is now widely accepted. It is another matter whether this is valid and a critical discussion of the situation was presented by Morrison & Morrison (1966 : 54-55). The group name has been given to a wide range of scale insects. Assuming the family-group to include *D. coccus* as type-species of *Dactylopius*, Ferris (1955*a*) used the name Dactylopiidae to include all the eriococcids which are currently placed in the family Eriococcidae. Later, Ferris (1957*b*) recognized the family Dactylopiidae as being distinct from the Eriococcidae but Hoy (1963) once again united the genus *Dactylopius* with the Eriococcidae, a very junior name. After a study is made of the adult males of *Dactylopius*, it should be possible to determine whether the genus is distinct from the Eriococcidae.

**DIASPIS** O. G. Costa, 1828.

DIASPITES Targioni-Tozzetti, 1868 : 713.

DIASPIDES Targioni-Tozzetti; Signoret, 1868 : 835.

DIASPITI Targioni-Tozzetti; Targioni-Tozzetti, 1869 : 259.

DIASPIDAE Targioni-Tozzetti; Maskell, 1879 : 189.

DIASPINAE Targioni-Tozzetti; Comstock, 1881*a* : 427.

DIASPINES Targioni-Tozzetti; Blanchard, 1883 : 231.

DIASPINA Targioni-Tozzetti; Douglas, 1886 : 245.

DIASPIDINAE Targioni-Tozzetti; Maskell, 1889 : 102.

DIASPIDI Targioni-Tozzetti; Targioni-Tozzetti, 1892 : 188.

DIASPIDINI Targioni-Tozzetti; MacGillivray, 1921 : 241.

DIASPIDIDAE Targioni-Tozzetti; Brues &amp; Melander, 1923 : 129.

DIASPIDOIDAE Targioni-Tozzetti; Balachowsky, 1942 : 37.

DIASPIDINA Targioni-Tozzetti; Balachowsky, 1954*e* : 18.DIASPIFORMES Targioni-Tozzetti; Balachowsky, 1954*e* : 164.

DIASPIDOIDEA Targioni-Tozzetti; Obenberger, 1957 : 394.

DIASPIDEA Targioni-Tozzetti; Borchsenius, 1965 : 362.

This group name has been one of the most widely used in the scale insects and while no one would wish to see it disappear, nevertheless it was published later than Lepidosaphidae Shimer. Morrison & Renk (1957 : 207) have stated 'From the collateral evidence (e.g. see Signoret 1868 : 842 et seq.), it seems certain that the Targioni "Catalogue" was issued as an independently paged separate paper in the year 1868; from the available evidence it seems definite that the serial publication occurred in February 1869'.

While agreeing with this statement, it seems reasonable to suppose that the independently paged paper appeared in the latter half of 1868, that is if the serial publication occurred as



late as February 1869. Shimer's paper is dated January 1868, hence Lepidosaphidae has priority, for the scale insects proper, over Diaspites Targioni-Tozzetti. To preserve both names it is necessary that the International Commission of Zoological Nomenclature should be asked to use their Plenary Powers to accept Lepidosaphidae as the junior name. Before this action is taken, however, it should be stated that there are problems concerning the use of *Lepidosaphes* which need to be resolved (Morrison & Morrison, 1966 : 107).

Both Obenberger and Borchsenius in recent years have elevated the group name to superfamily rank. It is not yet certain whether this will be generally accepted.

**DIMARGARODES** Silvestri, 1938.

DIMARGARODINI Jakubski, 1965 : 85.

The author placed this tribe in the subfamily Margarodinae of the family Margarodidae.

**DROSICHA** Walker, 1858.

DROSICHINI Morrison, 1927 : 105.

This is one of five tribes, included by Morrison (1928) in the subfamily Monophlebinae of the family Margarodidae.

**EREMOCOCCUS** Ferris, 1919.

EREMOCOCCINAE Borchsenius, 1960d : 88.

Borchsenius assigned this subfamily to the family Asterolecaniidae.

**ERIOCOCCUS** Targioni-Tozzetti, 1868.

ERIOCOCCINI Cockerell, 1899a : 389.

ERIOCOCCINAE Cockerell; Maxwell-Lefroy, 1909 : 758.

ERIOCOCCIDAE Cockerell; Brues & Melander, 1932 : 134.

ERIOCOCCI Cockerell; Silvestri, 1939 : 638.

In recent years the family Eriococcidae has gained wide acceptance. Its continued use must depend on whether the genus *Acanthococcus* is identical or not with *Eriococcus*, in which case Acanthococcidae would have priority. Kermidae and Dactylopiidae both have priority also and much depends on studies of the adult males of the type-species of each group. The statements by Morrison & Morrison (1966 : 69) regarding the use of *Acanthococcus* and the need for further study should be considered.

**ERIOPELTIS** Signoret, 1872.

ERIOPELTINI Šulc, 1941 : 3.

ERIOPELTINAE Šulc; Bodenheimer, 1952 : 317.

Borchsenius (1957) placed the genus *Eriopeltis* in the subfamily Filippiinae, family Coccidae. After studying adult males, Giliomee (1967) placed the genus *Filippia* Targioni-Tozzetti in quite a different group from that of *Eriopeltis*. Although Giliomee did not mention family-group names, it is evident that the Eriopeltinae is a major group within the family Coccidae. The name must take the date of Signoretiaria Atkinson, 1886 as this group name is based on a junior homonym (Article 39(a) (i)).

**EUMARGARODES** Jakubski, 1950.

EUMARGARODINAE Jakubski, 1965 : 47.

EUMARGARODINI Jakubski; Jakubski, 1965 : 49.

The subfamily is one of four near-related groups assigned by Jakubski to his concept of the family Margarodidae. This family is the same in content as the tribe Margarodini of Morrison (1928).



**EURHIZOCOCCUS** Silvestri, 1936.

EURHIZOCOCCINI Jakubski, 1965 : 172.

Jakubski placed this tribe in the subfamily Termitococcinae, family Termitococcidae.

**FILIPPIA** Targioni-Tozzetti, 1868.

FILIPPINAE Bodenheimer, 1952 : 317.

FILIPPIINAE Bodenheimer; Bodenheimer, 1953a : 93.

Borchsenius (1957) recognized the group as a subfamily in the family Coccidae. Giliomee (1967) regarded the adult males of *Filippia* as being close to *Coccus* and its relatives. The group name is available, nevertheless, as a tribe or subtribe within the subfamily Coccinae.

**FIORINIA** Targioni-Tozzetti, 1868.

FIORINIAE Leonardi, 1903 : 3.

FIORINIINI Leonardi; MacGillivray, 1921 : 241.

FIORINIINAE Leonardi; Brues & Melander, 1932 : 130.

Borchsenius (1965) recognized this group as a tribe in the subfamily Diaspidinae, family Diaspididae. All species in the group are pupillarial and there is need for a critical study of the adult males to verify Borchsenius' assignment.

**FURCASPIS** Lindinger, 1908.

FURCASPIDINA Balachowsky, 1958 : 249.

The author assigned this subtribe to the Aspidiotini. Borchsenius (1965) placed it, together with the *Pseudaonidiina*, in the tribe *Pseudaonidiini*, subfamily Aspidiotinae, family Diaspididae.

**GYMNASPIS** Newstead, 1898.

GYMNASPIDINA Balachowsky, 1958 : 315.

This subtribe was placed in the tribe Parlatoriini by Balachowsky, with which Borchsenius (1965) concurred.

**HALIMOCOCCUS** Cockerell, 1902.

HALIMOCOCCIDAE Brown & McKenzie, 1962 : 168.

As a result of cytological and morphological studies of a number of pupillarial forms in the Diaspididae and Phoenicococcidae, Brown & McKenzie suggested that a new family was needed to cater for the pupillarial genera in the Phoenicococcidae. From the text there are adequate distinguishing characters to recognize the suggested name Halimococcidae, formed from the name *Halimococcus*, and the family-group name is valid. The authors stated that the family was close to the family Diaspididae.

**HOWARDIA** Berlese & Leonardi, 1896.

HOWARDIINA Borchsenius, 1965 : 368.

This is one of four subtribes assigned by Borchsenius to the tribe Diaspidini of the family Diaspididae.



**ICERYA** Signoret, 1875.

ICERYINI Cockerell, 1899*m* : 274.

The current assignment of the tribe was made by Morrison (1928) to the subfamily Monophlebinae, family Margarodidae.

**KERMES** Boitard, 1828.

KERMESITES Signoret, 1875 : 15.

KERMITIDAE Signoret; Maskell, 1884 : 128.

KERMESARIA Signoret; Atkinson, 1886 : 285.

KERMESINAE Signoret; Ashmead, 1891 : 95.

KERMESINI Signoret; Ashmead, 1891 : 95.

KERMESIINAE Signoret; MacGillivray, 1921 : 45.

KERMESIDAE Signoret; Lobdell, 1929 : 762.

KERMIDAE Signoret; Ferris, 1937 : 5.

KERMINAE Signoret; Balachowsky, 1948 : 10.

The position of this group still awaits a correct assignment from a study of adult males. Balachowsky (1942, 1948*b*) linked the genus *Kermes* with the eriococcids and the pseudococcids. Ferris (1955*a*) included *Kermes* with the eriococcids. Borchsenius (1960*d*) recognized the name *Kermococcus* Silvestri in place of *Kermes* and accepted the family Kermococcidae for it. The writer agrees with Morrison & Morrison (1966) that *Kermococcus* is a synonym of *Kermes* and hence the name Kermococcidae is a junior synonym of Kermesites Signoret. Giliomee (1967) considered that the adult males of *Kermes* are much closer to the family Coccidae than to the eriococcids but this statement was tentative pending a thorough study of the adult males.

The word *Kermes* is not of Greek or Latin origin and the formation of a family-group name should not be inflected. If a family category is needed it should be Kermesidae.

**KERMOCOCCUS** Silvestri, 1911.

KERMOCOCCINAE Balachowsky, 1930 : 313.

KERMOCOCCINOS Balachowsky; Gomez-Menor, 1937 : 245.

KERMOCOCCI Balachowsky; Silvestri, 1939 : 629.

KERMOCOCCIDAE Balachowsky; Borchsenius, 1950*b* : 15.

As already stated under *Kermes* the genus *Kermococcus* is a junior synonym (Morrison & Morrison, 1966) and hence Kermococcinae Balachowsky is a junior synonym of Kermesites Signoret.

**KERRIA** Targioni-Tozzetti, 1884.

KERRIIDAE Lindinger, 1937 : 187.

KERRIINAE Lindinger; Lindinger, 1937 : 187.

Lindinger proposed this group name in place of Lacciferidae, because names in Oken (1915), in which the nominal genus *Laccifer* was described, were not consistently binominal. Later, Oken's work was invalidated by the International Commission of Zoological Nomenclature (see Morrison & Morrison, 1966 under *Laccifer*). As the Rules now stand the group name Lacciferidae is also invalid. Since *Laccifer* was presented binominally by Oken, it would be a simple matter to ask the Commission to use its Plenary Powers to validate it. On the other hand, as Kerriidae is still not widely used, the use of Tachardiidae, despite the synonymy of the nominal genus *Tachardia* Blanchard with *Kerria*, need not be precluded but this needs legal action also. As Morrison & Morrison (1966) have stated, there are now so few species involved currently placed in *Laccifer*, that the use of *Kerria* and its family name Kerriidae could easily be accepted.



**KUWANASPIS** MacGillivray, 1921.

KUWANASPIDINA Borchsenius, 1965 : 366.

Borchsenius placed this subtribe in the tribe Chionaspidini, subfamily Diaspidinae, family Diaspididae.

**KUWANIA** Fernald, 1903.

KUWANIINAE MacGillivray, 1921 : 45.

KUWANIINI MacGillivray; Handlirsch, 1925 : 1136.

KUWANI MacGillivray; Silvestri, 1939 : 635.

Morrison (1928) assigned the tribe Kuwaniini, along with two other tribes, to the subfamily Margarodinae, family Margarodidae. This has been widely accepted since.

Morrison and Morrison (1966) have credited Cockerell with the authorship of *Kuwanina*, a name mentioned by Fernald (1903*b*). Although Cockerell was responsible for the name, he was not responsible for the conditions that made it available (Article 50).

**LACCIFER** Oken, 1815.

LACCIFERIDAE Cockerell, 1924 : 47.

LACCIFERINAE Cockerell; Chamberlin, 1925 : 32.

LACCIFERINI Cockerell; Chamberlin, 1925 : 33.

LACCIFERI Cockerell; Chamberlin, 1925 : 33.

LACCIFERININA Cockerell; Balachowsky, 1950 : 9. (A *lapsus* for LACCIFERINA).

Cockerell proposed the family name in place of Tachardiidae because the genus *Laccifer* had priority over *Tachardia* Blanchard. A discussion on the use of Lacciferidae and its validity will be found under the genus *Kerria*.

**LECANIUM** Burmeister, 1835.

LECANITES Targioni-Tozzetti, 1868 : 713.

LECANIDES Targioni-Tozzetti; Signoret, 1869*a* : 98.

LECANITI Targioni-Tozzetti; Targioni-Tozzetti, 1869 : 258.

LECANIDAE Targioni-Tozzetti; Maskell, 1879 : 189.

LECANIEAE Targioni-Tozzetti; Maskell, 1879 : 205.

LECANINAE Targioni-Tozzetti; Comstock, 1881*a* : 427.

LECANINES Targioni-Tozzetti; Blanchard, 1883 : 231.

LECANINA Targioni-Tozzetti; Atkinson, 1886 : 268.

LECANIARIA Targioni-Tozzetti; Atkinson, 1886 : 277.

LECANIDINAE Targioni-Tozzetti; Maskell, 1887 : 46.

LECANIINI Targioni-Tozzetti; Ashmead, 1891 : 98.

LECANIINAE Targioni-Tozzetti; Cockerell, 1896*b* : 329.

LECANIIDAE Targioni-Tozzetti; Cockerell, 1929 : 150.

LECANOIDAE Targioni-Tozzetti; Balachowsky, 1942 : 37.

LECANINI Targioni-Tozzetti; Balachowsky, 1948*b* : 255.

LECANIOIDEA Targioni-Tozzetti; Obenberger, 1957 : 388.

This group name has been in continual use to the present day, despite acceptance that the nominal genus has the same type-species as the genus *Coccus* as used in the Fernald Catalogue, 1903. The family-group name Lecanites Targioni-Tozzetti is a junior synonym of Coccides Fallén, 1814 and should not be used.



**LECANODIASPIS** Targioni-Tozzetti, 1869.

LECANODIASPITES Targioni-Tozzetti, 1869 : 260.

LECANIODIASPIDAE Targioni-Tozzetti; Maskell, 1879 : 205.

LECANODIASPARIA Targioni-Tozzetti; Atkinson, 1886 : 276.

LECANIODIASPINI Targioni-Tozzetti; Ashmead, 1891 : 98.

LECANODIASPINI Targioni-Tozzetti; Targioni-Tozzetti, 1893 : 302.

LECANIODIASPIDIDAE Targioni-Tozzetti; Borchsenius, 1959 : 840.

This group has been widely accepted as belonging to the family Asterolecaniidae. Borchsenius (1959) regarded Lecanodiaspididae as a distinct family. It is not yet certain whether this is correct, even after a study of the adult males of an *Asterolecanium* by Munting & Giliomee (1967) and of *Lecanodiaspis* by Giliomee & Munting (1968). If *Lecanodiaspis* is not distinct, then the family-group name Lecanodiaspididae should be accepted in place of Asterolecaniidae on the grounds of priority.

**LEPIDOSAPHES** Shimer, 1868.

LEPIDOSAPHIDAE Shimer, 1868 : 372.

LEPIDOSAPHIDES Shimer; Silvestri, 1911 : 169.

LEPIDOSAPHINI Shimer; Lizer y Trelles, 1919 : 44 (reprint).

LEPIDOSAPHINAE Shimer; Brues & Melander, 1932 : 130.

LEPIDOSAPHEDINA Shimer; Balachowsky, 1954e : 19.

LEPIDOSAPHIDINI Shimer; Borchsenius, 1965 : 363.

This group has not gained acceptance as a distinct family but the nominate tribe and subtribe have been used in recent years. There are problems of priority concerning the genus *Mytilococcus* Amerling which still need to be resolved (Morrison & Morrison, 1967 : 107) and even acceptance of the type-species of *Lepidosaphes* needs further study. As stated already under *Diaspis* there is also the problem that the name Lepidosaphidae was published before Diaspites of Targioni-Tozzetti, in which case, if the Law of Priority is observed, then Lepidosaphidae should be used for all the scale insects proper now included in the family Diaspididae. To preserve both names, it is only necessary for Lepidosaphidae to be made the junior name under the Plenary Powers of the International Commission of Zoological Nomenclature. Even if *Mytilococcus* is accepted, then Shimer's group name can still be used in one or more categories. There is no need to accept the group name based on Mytilococci Silvestri, because there is still the name Mytilaspides of Leonardi having priority. The genus *Mytilaspis* has been resurrected and will probably gain acceptance. Since Borchsenius' work on the group, there are now few species remaining in the genus *Lepidosaphes* and any change in the generic and even the group name would not be too drastic. Borchsenius (1965) has recently accepted the subtribe Lepidosaphidina in the tribe Lepidosaphidini, subfamily Diaspidinae, family Diaspididae.

**LEUCASPIS** Targioni-Tozzetti, 1868.

LEUCASPIARIA Atkinson, 1886 : 271.

LEUCASPINI Atkinson; Ashmead, 1891 : 101.

LEUCASPIDES Atkinson; Leonardi, 1897 : 283.

LEUCASPIDINI Atkinson; MacGillivray, 1921 : 241.

LEUCASPIDINAE Atkinson; Brues & Melander, 1932 : 131.

LEUCASPIDINA Atkinson; Balachowsky, 1948b : 261.

This is another group name with some confusion over the type-genus. The problem has been discussed recently by Morrison & Morrison (1966 : 108, 109) and the main concern is whether *Leucaspis* Burmeister, 1835 used in the Hymenoptera is an invalid or valid emendation of *Leucopsis* Fabricius or whether *Leucaspis* Burmeister is a zoological name in the strict



sense. If the latter is correct, then *Leucaspis* Targioni-Tozzetti, 1868 is a junior homonym and its replacement by *Leucodiaspis* Signoret should be accepted. Most present workers agree that *Leucaspis* Burmeister is invalid and continue to use *Leucaspis* Targioni-Tozzetti, 1868 with the corresponding group name. Should there be a problem and if it is desired to retain the name *Leucaspis* and hence the group name, then application must be made to the International Commission of Zoological Nomenclature.

Borchsenius (1965) accepted the group as a tribe within the subfamily Parlatoriinae, family Diaspididae.

**LEUCODIASPIS** Signoret, 1869.

LEUCODIASPIDINA Zahradník, 1952 : 95.

LEUCODIASPIDINAE Zahradník; Zahradník, 1952 : 99.

LEUCODIASPIDINI Zahradník; Obenberger, 1957 : 422.

As stated under *Leucaspis*, the name *Leucodiaspis* should only be used if *Leucaspis* Targioni-Tozzetti, 1868 is a junior homonym of *Leucaspis* Burmeister, 1835.

**LLAVEIA** Signoret, 1876.

LLAVEIINI Morrison, 1927 : 106.

Morrison (1928) assigned this tribe to the subfamily Monophlebinae, Margarodidae.

**MARCHALINA** Vayssièrre, 1923.

MARCHALININI Morrison, 1927 : 102.

MARCHALINI Morrison; Silvestri, 1939 : 647.

The generally accepted position of this group was made by Morrison (1928), who included the tribe in the subfamily Coelostomidiinae, family Margarodidae.

**MARGARODES** Guilding, 1829.

MARGARODINAE Cockerell, 1899a : 390.

MARGARODINI Cockerell; Cockerell, 1899h : 416.

MARGARODIDAE Cockerell; Enderlein, 1914 : 370.

MARGARODINA Cockerell; Šulc, 1936 : 64.

MARGARODI Cockerell; Silvestri, 1939 : 637.

MARGAROIDAE Cockerell; Balachowsky, 1942 : 37.

MARGARODIDEA Cockerell; Bodenheimer, 1949 : 7.

MARGARODININAE Cockerell; Bodenheimer, 1952 : 318.

MARGARODOIDEA Cockerell; Obenberger, 1957 : 387.

The family name has been used in the literature recently to contain all the names of genera whose species possess abdominal spiracles but lack a setigerous anal ring. Both the nominate subfamily and tribe are in use today. Morrison (1928) confined the tribe to those genera near *Margarodes* possessing fossorial front legs and whose intermediate stages are in the form of ground pearls. Jakubski (1965) elevated this tribe to full family rank without taking into consideration the large number of subfamilies and tribes already recognized under the family Margarodidae.

The name of the family is junior to three other names; Porphyrophorites Signoret, 1875, Monophlebites Signoret, 1875 and Xylococcinae Pergande, 1898. The generic name *Porphyrophora* Brandt, 1833 was for a long time regarded as a synonym of *Margarodes* but the two genera are now accepted as being distinct. As Porphyrophorites Signoret has page precedence over Monophlebites, then the family name Porphyrophoridae should be used now for stability, together with the nominate subfamily and tribe.

The only other problem concerning the use of *Porphyrophora* is whether *Coccionella* Hahne-mann has priority; a matter discussed recently by Morrison & Morrison (1966).



**MATSUCOCCUS** Cockerell, 1909.

MATSUCOCCINI Morrison, 1927 : 101.

Morrison (1928) assigned this tribe to the subfamily Xylococcinae, family Margarodidae.

**MELANASPIS** Cockerell, 1897.

MELANASPIDINA Borchsenius, 1965 : 372.

This subtribe was placed by the author in the tribe Aspidiotini, subfamily Aspidiotinae, family Diaspididae.

**MICROCOCCUS** Leonardi, 1907.

MICROCOCCI Silvestri, 1939 : 702.

MICROCOCCINAE Silvestri; Balachowsky, 1942 : 43.

MICROCOCCINI Silvestri; Balachowsky, 1948b : 255.

Silvestri placed the subtribe Micrococci in the tribe Pseudococcini. Ferris (1957b) considered that the characters of *Micrococcus* were eriococcid and included the genus in the family Eriococcidae. Hoy (1963) agreed with this action. No critical study has yet been made of the adult male. The group name is, nevertheless, available within the family Eriococcidae.

**MONOPHLEBULUS** Cockerell, 1902.

MONOPHLEBULINI Morrison, 1927 : 106.

The author assigned this tribe to the subfamily Monophlebinae, family Margarodidae.

**MONOPHLEBUS** Guérin-Méneville, 1827.

MONOPHLEBITES Signoret, 1875 : 350.

MONOPHLEBIDAE Signoret; Maskell, 1880 : 294.

MONOPHLEBARIA Signoret; Atkinson, 1886 : 292.

MONOPHLEBINAE Signoret; Ashmead, 1891 : 93.

MONOPHLEBINAE Signoret; Berlese & Leonardi, 1898a : 285.

MONOPHLEBINI Signoret; Cockerell, 1899m : 274.

MONOPHLEBIINAE Signoret; Obenberger, 1957 : 398.

This group name has now gained wide acceptance as a subfamily within the family Margarodidae and most workers have followed the classification of Morrison (1928). As already stated under *Margarodes*, the group names Porphyrophorites Signoret and Monophlebites Signoret have priority over Margarodinae Cockerell. The subfamily Monophlebinae should therefore be included in the family Porphyrophoridae.

**MYTILASPIS** Targioni-Tozzetti, 1868.

MYTILASPIDES Leonardi, 1897 : 283.

MYTILASPINI Leonardi; Šulc, 1912 : 8.

For many years the name *Mytilaspis* has been a synonym of *Lepidosaphes* and hence Leonardi's group name has been forgotten. Borchsenius (1963) has once more recognized the genus *Mytilaspis* and if there are problems concerning the genus *Mytilococcus* having priority over *Lepidosaphes*, then the group name Mytilaspides is available in place of Mytilococchi Silvestri.



**MYTILOCOCCUS** Amerling, 1858.

MYTILOCOCCI Silvestri, 1939 : 773.

MYTILOCOCCINI Silvestri; Bodenheimer, 1949 : 27.

MYTILOCOCCINA Silvestri; Zahradník, 1952 : 95.

MYTILOCOCCINAE Silvestri; Obenberger, 1957 : 423.

As stated in the previous genus, even if *Mytilococcus* is accepted as having priority over *Lepidosaphes* Shimer, then *Mytilaspides* Leonardi still has priority over Silvestri's group *Mytilococci*.

**NEOMARGARODES** Green, 1914.

NEOMARGARODINAE Jakubski, 1965 : 54.

NEOMARGARODINI Jakubski; Jakubski, 1965 : 57.

The author assigned the subfamily to the family Margarodidae. Compared with other subfamilies at present accepted within the Margarodidae, *Neomargarodinae* seems to be too high a rank to accept.

**ODONASPIS** Leonardi, 1897.

ODONASPIDINI Ferris, 1937 : 7.

ODONASPIDES Ferris; Silvestri, 1939 : 773.

ODONASPIDINAE Ferris; Balachowsky, 1942 : 47.

Ferris originally assigned the tribe to the subfamily Diaspidinae, family Diaspididae. The latest interpretation is by Borchsenius (1965b), who accepted the group with subfamily status in the family Diaspididae.

**ORTHEZIA** Bosc d'Antic, 1784.

ORTHEZIDES Amyot & Serville, 1843 : 619.

ORTHEZITES Amyot & Serville; Targioni-Tozzetti, 1868 : 713.

ORTHEZITI Amyot & Serville; Targioni-Tozzetti, 1869 : 258.

ORTHEZIINAE Amyot & Serville; Cockerell, 1896b : 327.

ORTHEZINAE Amyot & Serville; Berlese and Leonardi, 1898a : 285.

ORTHEZIIDAE Amyot & Serville; Enderlein, 1914 : 369.

ORTHEZIINI Amyot & Serville; Silvestri, 1939 : 629.

ORTHEZIOIDEA Amyot & Serville; Chou, 1963 : 592.

This group is now accepted as one of the major families of the Coccoidea and distinct from the family Margarodidae. Various workers have linked both groups into a higher taxon. Chou, using the oldest name, has recognized a superfamily containing both the Margarodidae and Ortheziidae. There is obviously a relationship between the two families but there have been no critical studies of the adult males which would clarify the position. The family has been revised by Morrison (1925, 1952).

**PALAEOCOCCUS** Cockerell, 1894.

PALAEOCOCCINAE Heymons, 1915 : 183.

It is clear from the text and from the index on pp. XVI-XVII that Heymons based the group name on the nominal genus *Palaeococcus* to include also the genus *Orthezia*. Heymons also recognized the subfamilies Monophlebinae and Margarodinae. It is not clear why this action was taken. Morrison (1928) placed *Palaeococcus* in the tribe Monophlebini, subfamily Monophlebinae and in the present system of classification, *Palaeococcinae* would fall as a synonym of Monophlebinae.



**PARALECANIUM** Cockerell, 1899.

PARALECANIINI **trib. n.**

Belonging to the subfamily Coccinae, family Coccidae. The tribe contains at least four genera all of which differ from other genera in possessing a pair of eye spots on the dorsal surface of the head situated some distance from the margin and often directly opposite the antennal bases. In addition the stigmatic clefts are noticeably sunken and well sclerotized.

At present, apart from *Paralecanium*, the tribe also contains the following genera: *Platylecanium* Cockerell & Robinson, 1915, *Neoplatylecanium* Takahashi, 1929 and *Marsipococcus* Cockerell & Bueker, 1930.

**PARLATOREOPSIS** Lindinger, 1912.

PARLATOREOPSIDINA Borchsenius, 1965 : 370.

Borchsenius placed this subtribe in the tribe Parlatoriini, subfamily Parlatoriinae, family Diaspididae.

**PARLATORIA** Tergioni-Tozzetti, 1868.

PARLATORIAE Leonardi, 1897 : 283.

PARLATOREAE Leonardi; Lindinger, 1908 : 97.

PARLATORINI Leonardi; Lizer y Trelles, 1919 : 44.

PARLATORIINI Leonardi; MacGillivray, 1921 : 241.

PARLATORIINAE Leonardi; Brues & Melander, 1932 : 131.

PARLATORINA Leonardi; Balachowsky, 1948b : 261.

PARLATORIINA Leonardi; Borchsenius, 1965 : 370.

This group was not recognized by Ferris (1936a, 1937) or in any of his later works on the Diaspididae. Balachowsky (1948b) recognized both tribal and subtribal categories and these have been accepted by other workers. Since McKenzie & Nelson-Rees (1962) studied the cytology and Ghauri (1962) the adult males most workers recognize the group as being of major importance. Apart from the nominate subtribe, Borchsenius recognized two other subtribes in the Parlatoriini which, together with the Leucaspidini, form the subfamily Parlatoriinae in the family Diaspididae.

**PHENACASPIS** Cooley & Cockerell, 1899.

PHENACASPIDINA Borchsenius, 1965 : 366.

This subtribe was placed by the author in the tribe Chionaspidini, subfamily Diaspidinae, family Diaspididae.

**PHENACOCCUS** Cockerell, 1893.

PHENACOCCINAE Šulc, 1944 : 152.

PHENACOCCINI Šulc; Borchsenius, 1962a : 232.

Šulc used the subfamily name in place of Dactylopiinae of Fernald (1903b) and the Pseudococcinae of Silvestri (1911). Borchsenius placed the group in the Pseudococcidae.

**PHENACOLEACHIA** Cockerell, 1899.

PHENACOLEACHIINAE Cockerell, 1902g : 260.

PHENACOLEACHIINI Cockerell; Handlirsch, 1925 : 1137.

PHENACOLEACHIIDAE Cockerell; Brues & Melander, 1932 : 132.

PHENACOLEACHIDAE Cockerell; Balachowsky, 1942 : 38.



PHENACOLEACHINAE Cockerell; Balachowsky, 1948b : 251.

PHAENACOLEACHIIDAE Cockerell; Obenberger, 1957 : 389.

The exact relationship of the genus has been a problem since it was described. Theron (1962) made a comprehensive study of the adult male and concluded that it has some relationship with *Steingelia* Nassanov, a genus placed doubtfully in the Margarodidae. The position of the family-group name will be discussed further under *Steingelia*.

**PHOENICOCOCCUS** Cockerell, 1899.

PHOENICOCOCCINAE Stickney, 1934 : 26.

PHOENICOCOCCINI Stickney; Stickney, 1934 : 26.

PHOENICOCOCCI Stickney; Silvestri, 1939 : 706.

PHOENICOCOCCIDAE Stickney; Balachowsky, 1942 : 39.

Stickney studied the type-genus in great detail and erected the subfamily for it. He also included within the group a number of pupillarial genera centred around *Halimococcus*. The subfamily was assigned to the family Diaspididae. McKenzie & Nelson-Rees (1962) studied the cytology and dissociated *Phoenicococcus* from the other genera, for which they erected the family Halimococcidae. The authors stated that the genus *Xanthophthalma* Cockerell & Parrott was closely related to *Phoenicococcus*. Brown (1965) concurred with these results. In recent years some authors have regarded the family Phoenicococcidae as being distinct from the family Diaspididae. There is reason to believe that the family Halimococcidae should be accepted but the problem is where to place *Phoenicococcus* and its nominate subfamily together with the genus *Xanthophthalma* and its nominate subfamily. The adult males of *Phoenicococcus* described by Stickney are degenerate but seem to be quite distinct from those of the pupillarial genera herein accepted in the Halimococcidae. They approach the males of *Pseudochermes* Nitsche now placed in the Eriococcidae. Despite the views of Stickney and subsequent authors, the writer believes that *Phoenicococcus* and *Xanthophthalma* should be studied further in connection with the family Eriococcidae.

**PHYSOKERMES** Targioni-Tozzetti, 1868.

PHYSOKERMINI Šulc, 1912 : 6.

Šulc placed this tribe in the subfamily Coccinae.

**PITYOCOCCUS** McKenzie, 1942.

PITYOCOCCINI McKenzie, 1942 : 2.

The author assigned this tribe to the subfamily Coelostomidiinae, family Margarodidae.

**PLANOCOCCUS** Ferris, 1950.

PLANOCOCCINI Ezzat & McConnell, 1956 : 3.

The authors placed this tribe in the family Pseudococcidae.

**PLATYCOELOSTOMA** Morrison, 1923.

PLATYCOELOSTOMINI Morrison, 1927 : 102.

This tribe was assigned to the subfamily Coelostomidiinae, family Margarodidae.

**POLLINIA** Targioni-Tozzetti, 1868.

POLLINIINI Borchsenius, 1960 : 90.

Borchsenius placed this tribe in the subfamily Cerococcinae, family Asterolecaniidae. It certainly seems to belong to this subfamily but, as suggested under *Cerococcus*, the group has close affinities with the family Eriococcidae on the basis of the adult males.



**PORPHYROPHORA** Brandt, 1833.

PORPHYROPHORITES Signoret, 1875*b* : 346.

PORPHYROPHORIDAE Signoret; Maskell, 1887*a* : 91.

PORPHYROPHORINAE Signoret; Cockerell, 1896*b* : 323.

PORPHYROPHORINI Signoret; Jakubski, 1965 : 5.

As stated under the genus *Margarodes*, this name is the earliest to be used for the group currently known as the Margarodidae. As the genus *Porphyrophora* is accepted by a number of workers, for stability in the future, the family name Porphyrophoridae should be used on the grounds of priority. There is a problem, nevertheless, concerning *Coccionella* Hahne-  
mann and its priority over *Porphyrophora* discussed recently by Morrison & Morrison (1966).

**PSEUDAONIDIA** Cockerell, 1897.

PSEUDOANONIDINA Balachowsky, 1948*b* : 266.

PSEUDAONIDINA Balachowsky; Balachowsky, 1951 : 675.

PSEUDAONIDIINI Balachowsky; Borchsenius, 1965 : 372.

PSEUDAONIDIINA Balachowsky; Borchsenius, 1965 : 372.

The author assigned this subtribe to the tribe Aspidiotini. Borchsenius (1965), in a slightly different arrangement, placed the subtribe Pseudaonidina in the tribe Pseudaonidiini, subfamily Aspidiotinae, family Diaspididae.

**PSEUDOCOCCUS** Westwood, 1840.

PSEUDOCOCCINI Cockerell, 1905*b* : 193.

PSEUDOCOCCINAE Cockerell; Silvestri, 1911 : 132.

PSEUDOCOCCIDAE Cockerell; Lobdell, 1930 : 209.

PSEUDOCOCCI Cockerell; Silvestri, 1939 : 666.

PSEUDOCOCCOIDEA Cockerell; Chou, 1963 : 592.

The views of Morrison & Morrison (1966) concerning the validity of the genus should be studied in great detail. The family-group name has now become widely accepted for the mealybugs and coccidologists would feel any change here undesirable. Nevertheless, if *Pseudococcus* and the nominate group names are to be retained, then some form of application is needed to the International Commission of Zoological Nomenclature.

Most workers now recognize the Pseudococcidae as a family with a few subcategories. No serious attempt has been made to classify the family and the limits of the subfamilies and tribes remain obscure.

**PULVINARIA** Targioni-Tozzetti, 1866.

PULVINATI Targioni-Tozzetti, 1868 : 727.

PULVINARIEAE Targioni-Tozzetti; Maskell, 1879 : 205.

PULVINARIARIA Targioni-Tozzetti; Atkinson, 1886 : 277.

PULVINARIINI Targioni-Tozzetti; Ashmead, 1891 : 98.

The group name had not been widely used until Borchsenius (1957) published a classification of the Coccidae of the USSR. He accepted tribal status and, together with the tribe Coccini, placed them in the subfamily Coccinae, family Coccidae. Giliomee (1967) studied the adult males and confirmed that *Pulvinaria* is close to *Coccus*. Both probably belong to the same family-group.

**RHIZOECUS** Künckel d'Herculais, 1878.

RHIZOECINI **trib. n.**

Belonging to the family Pseudococcidae. Usually very small mealybugs with one or more of the following combinations of characters: Cerarii absent or confined to anal lobes, each



with a pair of long setae. Body setae minute, often numerous and often forming distinct groups. Antennae with bases close together and noticeably geniculate, with not more than six segments. Often with special bi- or tritubular pores peculiar to the group. Anal ring with large oval pores. Claws long and slender.

The group contains hypogeic and myrmecophilous mealybugs. A study of the group was made by Hambleton (1946). Beardsley (1962) has studied adult males of the type-species *Rhizoecus falcifer* Künckel d'Herculais. He considered them the most primitive of the mealybug males, the head not separated from the thorax by the usual constricted neck region. The structure of the penial sheath links the group to the *Phenacoccus* group of genera. Known males of *Pseudorhizoecus* studied by Green (1933) are degenerate.

Apart from the type-genus *Rhizoecus*, the tribe contains the following genera: *Geococcus* Green, *Pseudorhizoecus* Green, *Radiococcus* Hambleton, *Ripersiella* Tinsley, *Brevicoccus* Hambleton, *Neorhizoecus* Hambleton, *Eumyrmococcus* Silvestri and *Pygmaecoccus* McKenzie.

### **RUGASPIDIOTUS** MacGillivray, 1921.

RUGASPIDIOTINA Balachowsky, 1949 : 109.

Balachowsky (1953g) placed this subtribe in the tribe Odonaspidini. Borchsenius (1965) recognized the subtribe but transferred it to the tribe Diaspidini. Ghauri (1962) considered that the group was distinct from the Diaspidini after studying adult males of *Rugaspidotus tamaricicola* (Malenotti).

### **SCLOPETASPIS** MacGillivray, 1921.

SCLOPETASPIDINA Borchsenius, 1965 : 366.

The author placed this subtribe in the tribe Chionaspidini, subfamily Diaspidinae, family Diaspididae.

### **SELENASPIDUS** Cockerell, 1897.

SELENASPIDINA Balachowsky, 1948b : 266.

Balachowsky assigned this subtribe to the tribe Aspidiotini, subfamily Diaspidinae, family Diaspididae. Borchsenius (1965) agreed with this assignment but placed the Aspidiotini in the subfamily Aspidiotinae, family Diaspididae.

### **SERROLECANIUM** Shinji, 1935.

SERROLECANINIINAE Shinji, 1935 : 106. (A lapsus for SERROLECANIINAE).

As stated under *Antonina* the name has priority over Antoninini Borchsenius but is junior to Sphaerococcini Cockerell. It is, nevertheless, available should Sphaerococcini be subdivided.

### **SIGNORETIA** Targioni-Tozzetti, 1868.

SIGNORETIARIA Atkinson, 1886 : 276.

SIGNORETIINI Atkinson; Ashmead, 1891 : 98.

The name *Signoretia* Targioni-Tozzetti is a junior homonym and hence the nominate group name is invalid. Although the generic name was replaced by *Luzulaspis* Cockerell, there is no need for a new group name formed from the genus *Luzulaspis* because the genus belongs to the group Eriopeltini Šulc, 1941. Giliomee (1967) has studied the relationship of the adult males.



**SPHAEROCOCCUS** Maskell, 1892.

SPHAEROCOCCINI Cockerell, 1899a : 389.

The type-species *Sphaerococcus casuarinae* Maskell is very closely related to species of *Antonina*. The tribe Sphaerococcini has priority over Antoninini and over the group name Serrolecaniinae. Both latter names are available as subgroups if necessary.

**STEINGELIA** Nassanov, 1908.

STEINGELIINAE Morrison, 1927 : 101.

STEINGELIINI Morrison; Morrison, 1927 : 101.

Morrison (1927, 1928) assigned the subfamily to the Margarodidae. Theron (1958) studied the adult male and showed that it was an aberrant form and was probably a connecting link between Balachowsky's Margaroidae and Lecanoidae. The males of *Phenacoleachia* were shown by Theron (1962) to have close affinities with those of *Steingelia*. It seems possible that these genera should be included in the same family for which Phenacoleachiidae has priority. The subfamily name Steingeliinae is also available within the family. The American species of *Puto*, of which the males of *P. yuccae* (Coquillett) have been studied by Beardsley (1962), may also belong to this group but this needs further study.

**STICTOCOCCUS** Cockerell, 1905.

STICTOCOCCINAE Lindinger, 1913 : 63.

STICTOCOCCI Lindinger; Silvestri, 1939 : 704.

STICTOCOCCIDAE Lindinger; Balachowsky, 1942 : 38.

Balachowsky (1942) included this group in the 'phylum' Lecanoidae. Ferris (1957b) did not assign the genus to any of the families or rami he discussed, but left it as one of four unplaced genera needing further research. The adult males would certainly place the genus in Balachowsky's Lecanoidae but a thorough study is needed to determine its closest affinities.

**STIGMACOCCUS** Hempel, 1900.

STIGMACOCCINI Morrison, 1927 : 100.

The author placed this tribe in the subfamily Xylococcinae, family Margarodidae.

**TACHARDIA** Blanchard, 1886.

TACHARDIINAE Green, 1896 : 17.

TACHARDIIDAE Green; Ferris *in* Chamberlin, 1923 : 163.

TACHARDIINI Green; Chamberlin, 1923 : 163.

Cockerell (1924) proposed the family name Lacciferidae for this group because the name *Tachardia* was shown to be a synonym of *Laccifer* Oken. Lindinger (1937) proposed the name Kerriidae in place of Lacciferidae because *Laccifer* was regarded as invalid.

**TACHARDIELLA** Cockerell, 1901.

TACHARDIELLI Chamberlin, 1925 : 39

The author assigned this subtribe to the tribe Lacciferini. In accordance with modern custom the writer proposes the spelling Tachardiellina.



**TACHARDINA** Cockerell, 1901.

TACHARDININI Chamberlin, 1923 : 199.

TACHARDININAE Chamberlin; Chamberlin, 1925 : 40.

TACHARDININA Chamberlin; Balachowsky, 1950 : 9.

Chamberlin (1925) placed the subfamily and tribe in the family Lacciferidae. Balachowsky (1950) recognized a subtribe for two known genera and a new genus *Paratachardina*.

**TARGIONIA** Signoret, 1869.

TARGIONINA Balachowsky, 1948b : 266.

TARGIONIINI Balachowsky; Borchsenius, 1965 : 372.

TARGIONIINA Balachowsky; Borchsenius, 1965 : 372.

Balachowsky assigned the subtribe to the tribe Aspidiotini, subfamily Diaspidinae, family Diaspididae. Borchsenius (1965), in a new classification of the Diaspididae, placed the subtribe in the tribe Targioniini, subfamily Aspidiotinae.

**TERMITOCOCCUS** Silvestri, 1901.

TERMITOCOCCIDAE Jakubski, 1965 : 167.

TERMITOCOCCINAE Jakubski; Jakubski, 1965 : 168.

TERMITOCOCCINI Jakubski; Jakubski, 1965 : 168.

Silvestri (1936) showed that the genus has close affinities with *Margarodes* and, together with a new genus *Eurhizococcus*, placed them in the family Margarodidae. Jakubski has elevated the group to a much higher category than it warrants.

**TRABUTINA** Marchal, 1904.

TRABUTINI Silvestri, 1939 : 60.

TRABUTININAE Silvestri; Bodenheimer, 1949 : 7.

Although Silvestri assigned the subtribe Trabutini to the tribe Pseudococcini he did not associate the genus with the mealybugs proper. Bodenheimer (1949) placed the subfamily in the Eriococcidae and regarded the group as equal in rank to the Pseudococcinae. Ferris (1950b) associated *Trabutina* with the genera *Nipaecoccus* Šulc, *Naiacoccus* Green and *Amonostherium* Morrison, the so-called blue-black mealybugs. The group name is, therefore, available for these genera.

**XANTHOPHTHALMA** Cockerell & Parrott, 1899.

XANTHOPHTHALMINI Ferris, 1937 : 7.

XANTHOPHTHALMINAE Ferris; Balachowsky, 1942 : 47.

Ferris placed the tribe in the subfamily Diaspidinae, family Diaspididae. Borchsenius (1965) considered the group as having subfamily status within the Diaspididae. McKenzie & Nelson-Rees (1962) in their cytological studies, stated that it had some relationship with the genus *Phoenicococcus*. As already mentioned under the latter name, the two groups may have affinities with the Eriococcidae.

**XEROPHILASPIS** Cockerell, 1897.

XEROPHILASPIDINA Borchsenius, 1965 : 368.

This subtribe was placed by its author in the tribe Diaspidini, subfamily Diaspidinae, family Diaspididae.



**XYLOCOCCUS** Löw, 1883.

XYLOCOCCINAE Pergande, *in* Hubbard & Pergande, 1898 : 26.

XYLOCOCCINI Pergande; Cockerell, 1899*m* : 275.

XYLOCOCCI Pergande; Silvestri, 1939 : 634.

XYLOCOCCIDAE Pergande; Zahradník, 1959*a* : 527.

Morrison (1928) accepted both the tribe and subfamily ranks in the family Margarodidae. Zahradník elevated the group to a family of equal rank to the Margarodidae and Monophlebidae. The group name has priority over Margarodidae.

## GROUP NAMES NOT BASED ON NOMINAL GENERA

The following names have been used from time to time for groups containing either all or part of the scale insects. Some names used for family and lower categories are invalid because they are not based on nominal genera. Other names used for categories higher than a superfamily may not necessarily be invalid but are also listed here for completeness.

ANASPIDIOTI Thiem & Gerneck, 1934 : 230. There is no connection between this name and *Anaspidotus* Borchsenius and Williams, 1963.

APETALASPIDIOTINA Thiem & Gerneck, 1934 : 230.

APTERA Leunis, 1860 : 653.

ARCHAEOCOCCIDEA Bodenheimer, 1952 : 317.

CECIDURGIDAE Schrader, 1863 : 191.

COCCIDOMORPHA Heslop-Harrison, 1952 : 688.

COCCOMORPHA Chou, 1963 : 592.

CRYPTO-KERMITIDAE Maskell, 1884 : 128.

CRYPTOKERMITIDAE Maskell, 1887*a* : 87. This name was not formed from a genus.

It has no standing despite the later appearance of *Cryptokermes* Hempel, 1900.

GALLINSECTA Latreille, 1802 : 265.

HEMI-COCCIDAE Maskell, 1884 : 128.

HEMICOCCIDINAE Maskell, 1887*a* : 38.

HEMICOCCINAE Green, 1896*e* : 314.

HEMICOCOCCINAE Maskell, 1897 : 314.

HAEMICOCCINAE Silvestri, 1901 : 132.

HEMICOCCIDAE Enderlein, 1914 : 369.

HYMENELYTRA Latreille, 1825 : 428.

IDIOCOCCIDAE Maskell, 1893*b* : 236. This name has no connection with the genus *Idiococcus* Takahashi & Kanda, 1939.

IDIOCOCCINAE Maskell, 1894*b* : 329.

LANINSECTA Amyot & Serville, 1843 : 613.

LECANO-COCCIDAE Maskell, 1882 : 223.

LECANIO-COCCIDAE Maskell, 1884 : 128.

LECANOCOCCINAE Maskell, 1897 : 314.

METASPIDIOTI Thiem & Gerneck, 1934 : 230. Takagi's genus *Metaspidiotus*, 1957, has no connection with this name.

MICROHOMOPTERA Crampton, 1916 : 301.

MONOMERA Westwood, 1840 : 444.

MONOPTERA Lindinger, 1927 : 366.

NEOCOCCIDAE Bodenheimer, 1943 : 26.

NEOCOCCIDEA Bodenheimer, 1952 : 317.

NEOCOCCOIDEA Borchsenius, 1950*b* : 14.

NEOCOCCOMORPHA Borchsenius, 1965 : 362.

PALEOCOCCOIDEA Borchsenius 1950*b* : 14. This name has no relationship to *Palaeococcus* Cockerell, 1894.



- PALEOCOCCOMORPHA Borchsenius, 1965 : 362.  
 PETALASPIDIDIOTINA Theim & Gerneck, 1934 : 230.  
 PHYTADELGES Duméril, 1806 : 269.  
 PHYTATHELGI Amyot & Serville, 1843 : 618.  
 PROBOSCIDIA Woodworth, 1915 : 121.  
 PSEUDOPTERES Amyot, 1847 : 488.  
 SCHRADERIAE Fuller, 1897b : 1345.  
 TOUMEYELLINI Berry, 1959 : 198. This is obviously a *lapsus* for the generic name *Toumeyella* Cockerell, and is without nomenclatorial standing. A group name formed from the genus *Toumeyella* is probably needed, nevertheless.

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The coding to the references cited in the text is taken from MORRISON, H. & RENK, A. V. 1957. A Selected Bibliography of the Coccoidea. *Misc. Publs U.S. Dep. Agric.* **734** : 222 pp., and MORRISON, H. & MORRISON, E. 1965. A Selected Bibliography of the Coccoidea, First Supplement. *Misc. Publs U.S. Dep. Agric.* **987** : 44 pp. Only those references not mentioned in these two publications are listed underneath.

Certain family-group names have been credited to Enderlein, 1920 by some authors. This reference is in the second edition of Brohmer's *Fauna von Deutschland*. The first edition was published in 1914 and names have been checked from this source. Thanks are due to Professor Z. Kawecki of the Agricultural University (S.G.G.W.), Warsaw who kindly supplied photocopies of the Coccoidea sections in both these editions.

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DOUGLAS JOHN WILLIAMS, B.Sc., Ph.D.  
 COMMONWEALTH INSTITUTE OF ENTOMOLOGY  
 c/o BRITISH MUSEUM (NATURAL HISTORY)  
 CROMWELL ROAD  
 LONDON. S.W.7





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