

SVERIGES GEOLOGISKA UNDERSÖKNING

SER C NR 696

AVHANDLINGAR OCH UPPSATSER

ÅRSBOK 68 NR 3

SYLVIA FORCHHEIMER

THE STRATIGRAPHICAL
DISTRIBUTION OF CRETACEOUS
COCCOLITHS



STOCKHOLM 1974

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ABSTRACT

Up to now have been published four different catalogues (DEFLANDRE, FARINACCI, LOEBLICH et TAPPAN and REINHARDT) dealing with taxonomy, morphology, and stratigraphy of coccoliths. As a biostratigraphical distribution illustrated in tables in alphabetical order seemed to be useful, a supplement has been made. The present paper based mainly on the above named catalogues, appeared up to 1970, obtains twelve tables showing the vertical range of Cretaceous coccoliths from the Valanginian to the Maastrichtian. A synonymy list is enclosed.

ZUSAMMENFASSUNG

Zur Zeit sind vier verschiedene Katalogen über Coccolithen (DEFLANDRE, FARINACCI, LOEBLICH et TAPPAN und REINHARDT) erschienen. Wünschenswert ist eine vertikale Verbreitung dieser Fossilien in Tabellenform. Die vorliegende Arbeit zeigt daher in zwölf Tabellen die stratigraphische Verbreitung der Coccolithen aus der Kreide von dem Valangin bis zum Maastricht. Eine Synonymliste ist beigelegt.

РЕЗЮМЕ

Стратиграфическое распространение кокколитов в меловых отложениях (Валангин-Маастрихт) основано главным образом на каталогах опубликованных Дефландром, Фаринацци, Лоеблихом и Татпан, и Рейнхардтом до 1970. Статья иллюстрирована 12 таблицами и комплирована синонимным списком.

REMARKS TO THE TABLES

The coccoliths are of great importance not only for the biostratigraphy but also as sedimentformer. Together with foraminifers they constitute white-chalk sediments. In oil geology they became very valuable in age determination of core-sediments. Due to their worldwide occurrence there is an excellent possibility for correlation.

During many years of investigations I felt an obvious lack of tables concerning a vertical distribution of coccoliths from the Cretaceous in alphabetical

order. The present paper based mainly on catalogues published by DEFLANDRE (1967–1969), FARINACCI (1969–1970), LOEBLICH et TAPPAN (1966–1969) and REINHARDT (1970) obtains twelve tables showing the vertical range of the coccoliths from the Valanginian – Maastrichtian.

It is my opinion that these tables may be valuable for all my colleagues in the field of coccolith research, and I hope that the tables will be completed with references occurring after 1970.

Cretaceous coccoliths have been first reported by Arkhangelsky (1912). From about the middle of this century the number of investigations of these fossils increased rapidly. Up to 1970 coccoliths from the Cretaceous sediments were described by the authors mentioned in the reference list (p. 29).

Before 1950 descriptions of coccoliths were based entirely on light microscope observations. The morphological characteristics that have hitherto been treated within the terminology are mainly the shape of the coccolith, structure of central area (cross, ridge, perforations), and striae of the rim. During the last two decades new tools like electron microscopes (TEM, SEM) have been used. Investigations of the ultrastructure of coccoliths resulted in new genera as well as new species. The main problem is to identify the same specimen in both microscopes (light, and electron). PERCH-NIELSEN (1967) described a method for the study of the same specimen first in the light microscope, and afterwards in the transmission electron microscope. FORCHHEIMER (1968) mentioned a preparation method for scanning electron microscopy by using a circular cover glass. This coccolith supporter is investigated first in the light microscope and then it is placed on a stub for investigations under the scanning electron microscope. A suitable marking on the glass is used as a position reference for the investigated specimen. Both methods, however, are not suitable for routine work. THIERSTEIN et al (1971) described a new preparation method in using a corner of a rectangular cover glass instead of a circular one. "The corner of the cover glass is taken as a fixed point and its position is described using the x and y translation directions as coordinates. In perpendicular view and at constant z (vertical) translation control the positions of all specimens are related to the fixed point".

The present author, however, has continued investigations in this matter in order to find a more easy handy, and quick method. As a result from these investigations a slide will be presented. It is provided with a microscopic network, designed in such a way, that all areas are consecutively subdivided in different signed parts. A system like this is independent of outer coordinates, and all positions are unambiguous. By a special technique all lines, and signs are adapted in dimensions suitable for both light- and scanning electron microscopy.

A great number of synonyms are based on comparisons with light microscope micrographs, drawings, and electron microscope micrographs. These comparisons are made only in cases of unambiguous identifications. The present paper includes the synonyms in special lists. The numbers in front of the synonyms are related to those in the tables.

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SYNONYMS (TABLE 1)

1. *Cretarhabdus dietzmanni* (REINHARDT) REINHARDT, 1966a
Podorhabdus dietzmanni (REINHARDT) REINHARDT, 1967
2. *Cretarhabdus? granulatus* (REINHARDT) REINHARDT, 1966a
Podorhabdus granulatus (REINHARDT) BUKRY, 1969
Bipodorhabdus granulatus (REINHARDT) NOËL, 1970a
3. *Ahmuellerella octoradiata* (GÓRKA) REINHARDT, 1966
Staurolithites limbitenusis (REINHARDT) SHUMENKO, 1968
4. *Arkhangelskiella obliqua* STRADNER, 1963
Arkhangelskiella ornamenta (CARATINI) PERCH-NIELSEN, 1968
Gartnerago obliquus (REINHARDT) NOËL, 1970a
Gartnerago inclinatum (REINHARDT) REINHARDT, 1970b
5. *Rhabdolithus splendens* DEFLANDRE, 1953
Rhabdolithina splendens (DEFLANDRE) REINHARDT, 1967
Parhabdolithus splendens (DEFLANDRE) NOËL, 1969b
6. *Laffittius obliquus* (REINHARDT) NOËL, 1969
Gartnerago obliquus (REINHARDT) NOËL, 1970
Gartnerago inclinatum (REINHARDT) REINHARDT, 1970b
7. *Broinsonia distincta* (SHUMENKO) REINHARDT, 1970a
8. *Arkhangelskiella specillata ethmopora* BUKRY, 1969
9. *Arkhangelskiella obliqua* STRADNER, 1963
Discolithus ornamentus CARATINI, 1963
Laffittius obliquus (REINHARDT) NOËL, 1969a
Gartnerago obliquus (REINHARDT) NOËL, 1970a
Gartnerago inclinatum (REINHARDT) REINHARDT, 1970b
10. *Laffittius magnacavus* (GARTNER) NOËL, 1969a
Arkhangelskiella parca STRADNER, 1963
11. *Discolithus ornamentus* CARATINI, 1963
Laffittius obliquus (REINHARDT) NOËL, 1969
Gartnerago obliquus (REINHARDT) NOËL, 1970a
Gartnerago obliquum REINHARDT, 1970b
12. *Broinsonia parca* (STRADNER) BUKRY, 1969
Aspidolithus parvus (STRADNER) NOËL, 1969a
13. *Broinsonia bevieri* BUKRY, 1969
14. *Arkhangelskiella lata* (NOËL) REINHARDT, 1970a
Broinsonia lata (NOËL) NOËL, 1970a
15. *Broinsonia signata* (NOËL) NOËL, 1970a
16. *Discorhabdus ignotus* (GÓRKA) PERCH-NIELSEN, 1968
Biscutum cruciatum (BUKRY) REINHARDT, 1970a
17. *Biscutum cruciatum* (BUKRY) REINHARDT, 1970a
18. *Biscutum ignotum* (BUKRY) REINHARDT, 1970a
19. *Biscutum ignotum* (BUKRY) REINHARDT, 1970a
20. *Biscutum ignotum* (GÓRKA) REINHARDT et GÓRKA, 1967
Biscutum constans PERCH-NIELSEN, 1968a
21. *Biscutum ignotum* (GÓRKA) REINHARDT et GÓRKA, 1967
Biscutum testudinarium BLACK et BARNES, 1959
Discorhabdus ignotus (GÓRKA) PERCH-NIELSEN, 1968a

SYNONYMS (TABLE 2)

1. *Micrantholithus africanus* (STRADNER) LYUL'EVA, 1967a
2. *Braarudosphaera turbinea* REINHARDT, 1970a
3. *Aspidolithus latus* NOËL, 1969
4. *Eiffellithus trabeculatus* (GÓRKA) REINHARDT et GÓRKA, 1967
5. *Zycolithus achylosus* (STOVER) STRADNER, 1967a
Cylindralithus achylosus (STOVER) PERCH-NIELSEN, 1968a
6. *Eiffellithus eximius* (STOVER) PERCH-NIELSEN, 1968a
7. *Coccolithus circumradiatus* (STOVER) LYUL'EVA, 1967a
Markalius circumradiatus (STOVER) PERCH-NIELSEN, 1968a
8. *Biscutum? supracretaceum* (REINHARDT) PERCH-NIELSEN, 1968a

SYNONYMS (TABLE 3)

1. *Cretarhabdus crenulatus* BRAMLETTE et MARTINI, 1964
Cretarhabdus romani (GÓRKA) STRADNER et al., 1968
Polypodorhabdus actinosus (STOVER) PERCH-NIELSEN, 1968
Watznaueria actinosa (STOVER) BUKRY, 1969
Cretarhabdus surirellus (DEFLANDRE) REINHARDT, 1970b
2. *Cribrosphaerella arkhangelskii* (SHUMENKO) REINHARDT et GÓRKA, 1967
Cribrosphaera arkhangelskii (SHUMENKO) HOFFMAN, 1970a
3. *Watznaueria coronata* (GARTNER) BUKRY, 1969
4. *Cribrosphaerella ehrenbergi* (ARKHANGELSKY) DEFLANDRE, 1954
5. *Actinosphaera deflandrei* NOËL, 1965
6. *Cylindralithus gallicus* (STRADNER) BRAMLETTE et MARTINI, 1964
Sollasites horticus (STRADNER et al.) BLACK, 1968
7. *Costacentrum horticum* (STRADNER et al.) BUKRY, 1969
8. *Coccolithus barnesae* (BLACK) BRAMLETTE et MARTINI, 1964
9. *Staurolithites matalosus* (STOVER) CEPEK et HAY, 1969
10. *Watznaueria melaniae* (GÓRKA) REINHARDT et GÓRKA, 1967
Biscutum constans (GÓRKA) PERCH-NIELSEN, 1968a
Biscutum melaniae (GÓRKA) REINHARDT, 1970a
11. *Watznaueria angustoralis* REINHARDT, 1966b
Coccolithus barnesae (BLACK) BRAMLETTE et MARTINI, 1964
Watznaueria barnesae (BLACK) PERCH-NIELSEN, 1968a
Watznaueria paenepelagica (STOVER) BUKRY, 1969
12. *Crepidolithus minimus* (REINHARDT) REINHARDT 1970b
13. *Cribrosphaera ehrenbergi* ARKHANGELSKY, 1912
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
14. *Stradneria limbicrassa* REINHARDT, 1964
15. *Podorhabdus coronadventis* (REINHARDT) REINHARDT, 1970b
16. *Cretarhabdus ingens* (GÓRKA) REINHARDT et GÓRKA, 1967
Polypodorhabdus crenulatus (BRAMLETTE et MARTINI) PERCH-NIELSEN, 1968a
Cretarhabdus surirellus (DEFLANDRE) REINHARDT, 1970b
Stradneria crenulata (BRAMLETTE et MARTINI) NOËL, 1970a
17. *Cretarhabdus surirellus* (DEFLANDRE) REINHARDT, 1970b
18. *Podorhabdus coronadventis* (REINHARDT) REINHARDT, 1970b
19. *Cribrosphaerella ehrenbergi* (ARKHANGELSKY) DEFLANDRE, 1954
20. *Cribrosphaerella porosa* (MASLOW) MASLOW, 1963
21. *Cribrosphaera ehrenbergi* ARKHANGELSKY, 1912
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
22. *Cribrosphaera pchaleki* (REINHARDT) REINHARDT, 1966a
Cribrosphaera hilli (BLACK) HOFFMAN, 1970a
Cribrosphaerella hilli (BLACK) REINHARDT, 1970b

SYNONYMS (TABLE 4)

1. *Cribrosphaera pelta* (GARTNER) BUKRY, 1969
2. *Cribrosphaerella arkhangeliskii* (SHUMENKO) REINHARDT et GÓRKA, 1967
Cribrosphaera arkhangeliskii SHUMENKO, 1962
Cribrosphaera ehrenbergi ARKHANGELSKY, 1912
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
3. *Cribrosphaera tectiforma* REINHARDT, 1964
Biscutum constans (GÓRKA) PERCH-NIELSEN, 1968
Biscutum melaniae (GÓRKA) REINHARDT, 1970a
Calyptrolithus tectiforma (REINHARDT) SHUMENKO, 1969b
4. *Cyclolithus redimiculatus* STOVER, 1966
Cricolithus multiradiatus KAMPTNER in STRADNER et al, 1968
5. *Markalius rotaclypeatus* (BUKRY) REINHARDT, 1970b
6. *Markalius chronolithus* (BUKRY) REINHARDT, 1970b
7. *Tergestiella margereli* (NOËL) SHUMENKO, 1968
Tremalithus barnesae BLACK et BARNES, 1959
Tergestiella barnesae (BLACK) REINHARDT, 1964
8. *Markalius circumradiatus* (STOVER) PERCH-NIELSEN, 1968
Markalius rotaclypeatus (BUKRY) REINHARDT, 1970b
9. *Markalius circumradiatus* (STOVER) PERCH-NIELSEN, 1968
Markalius inversus (DEFLANDRE) BRAMLETTE et MARTINI, 1964
10. *Cyclococcolithina waxahachia* BUKRY, 1969
Markalius inversus (DEFLANDRE) BRAMLETTE et MARTINI, 1964
11. *Biantholithus radialis* (CARATINI) GARTNER, 1968
12. *Loxolithus armilla* (BLACK et BARNES) NOËL, 1965
Cyclolithella inflexa (KAMPTNER et DEFLANDRE) LOEBLICH et TAPPAN, 1963
13. *Cyclolithus simplex* GARDET, 1955
Coccolithites cingulum KAMPTNER, 1955
Cricolithus cingulum (KAMPTNER) KAMPTNER, 1956a
Ellipticolithites cingulum (GÓRKA) CARATINI, 1963
14. *Cricolithus pemmatoideus* DEFLANDRE in MANIVIT, 1965
Apertapetra gronosa (STOVER) BUKRY, 1969
15. *Cricolithus multiradiatus* KAMPTNER, 1955
Cricolithus redimiculatus (STOVER) FORCHHEIMER, 1968
16. *Cylindralithus serratus* BRAMLETTE et MARTINI, 1964
17. *Cylindrosphaerites alpanensis* (MASLOW) MASLOW, 1963
18. *Prediscosphaera rhombica* (PERCH-NIELSEN) REINHARDT, 1970b
19. *Deflandrius cretaceus* (ARKHANGELSKY) BRAMLETTE et MARTINI, 1964
Prediscosphaera columnatus (STOVER) BUKRY et BRAMLETTE, 1969b
Prediscosphaera cretacea (ARKHANGELSKY) GARTNER, 1968
20. *Prediscosphaera rhombica* (PERCH-NIELSEN) REINHARDT, 1970b
21. *Prediscosphaera spinosa* (BRAMLETTE et MARTINI) GARTNER, 1968
Prediscosphaera propinqua (GÓRKA) REINHARDT, 1970b
22. *Prediscosphaera quadripunctata* (GÓRKA) REINHARDT, 1970b
23. *Discolithus elegans* (GÓRKA) DEFLANDRE, 1959
24. *Corollithion emendatus* (LYUL'ÉVA) CEPEK et HAY, 1969
25. *Discolithus quadratus* (GÓRKA) DEFLANDRE, 1959
26. *Discolithus tenuis* (GÓRKA) DEFLANDRE, 1959
27. *Biscutum constans* (GÓRKA) BLACK, 1967

SYNONYMS (TABLE 5)

1. *Discolithus theta* BLACK et BARNES, 1959
2. *Staurolithites anceps* (GÓRKA) REINHARDT, 1966a
Eiffellithus anceps (GÓRKA) REINHARDT et GÓRKA, 1967
Helicolithus anceps (GÓRKA) NOËL, 1970a
3. *Ahmuellerella asper* (STRADNER) REINHARDT, 1965
4. *Zycolithus diplogrammus* DEFLANDRE, 1954
5. *Staurolithites bochothnicae* (GÓRKA) REINHARDT, 1965
Eiffellithus bochothnicae (GÓRKA) REINHARDT et GÓRKA, 1967
Zycolithus crux (DEFLANDRE et FERT) BRAMLETTE et SULLIVAN, 1961
Glaukolithus bochothnicae (GÓRKA) PERCH-NIELSEN, 1968a
6. *Prediscosphaera cretacea* (ARKHANGELSKY) GARTNER, 1968
7. *Biscutum constans* PERCH-NIELSEN, 1968
Biscutum melaniae (GÓRKA) REINHARDT, 1970b
8. *Coccolithites cruciatus* KAMPTNER, 1955
9. *Rhagodiscus* ? *cryptochondrus* (STOVER) REINHARDT, 1967
10. *Eiffellithus trabeculatus* (GÓRKA) REINHARDT et GÓRKA, 1967
Chiastozygus disgregatus (STOVER) BUKRY, 1969
Eiffellithus disgregatus (STOVER) HOFFMAN, 1970a
11. *Parhabdololithus embergeri* (NOËL) STRADNER, 1963
12. *Eiffellithus anceps* (GÓRKA) REINHARDT, 1966
Zycolithus litterarius (GÓRKA) STRADNER et al., 1968
Glaukolithus fessus (STOVER) PERCH-NIELSEN, 1968a
13. *Cribrosphaerella ehrenbergi* (ARKHANGELSKY) DEFLANDRE, 1954
14. *Zycolithus geometricus* (GÓRKA) STRADNER, 1967a
15. *Coccolithites glabrus* KAMPTNER, 1955
16. *Deflandrius spinosus* BRAMLETTE et MARTINI, 1964
Prediscosphaera propinqua (GÓRKA) REINHARDT, 1970b
17. *Discolithina ingens* (GÓRKA) TREXLER, 1967
Cretarhabdus ingens (GÓRKA) REINHARDT et GÓRKA, 1967
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
18. *Chiastozygus initialis* (GÓRKA) CEPEK et HAY, 1969
19. *Rhabdololithus litterarius* (GÓRKA) STRADNER, 1963
Zygrhablithus litterarius (GÓRKA) CARATINI, 1964
Zycolithus litterarius (GÓRKA) TREXLER, 1967
20. *Discolithina lucida* (STRADNER) TREXLER, 1967
21. *Staurolithites maltanensis* (GÓRKA) CARATINI, 1964
Zycolithus maltanensis (GÓRKA) STRADNER, 1963
Prediscosphaera cretacea (ARKHANGELSKY, 1912) GARTNER, 1968
22. *Staurolithites mielnicensis* (GÓRKA) LYUL'ÉVA, 1967b
Zycolithus crux (DEFLANDRE et FERT) BRAMLETTE et SULLIVAN, 1961
Eiffellithus bochothnicae (GÓRKA) REINHARDT et GÓRKA, 1967
23. *Discolithina multicava* (GÓRKA) GARTNER, 1968
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
24. *Discolithina numerosa* (GÓRKA) BRAMLETTE et MARTINI, 1964
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
Cribrosphaerella numerosa (GÓRKA) REINHARDT et GÓRKA, 1967

SYNONYMS (TABLE 6)

1. *Arkhangelskiella ornamenta* (CARATINI) LYUL'eva, 1967b
2. *Coccolithus parvidentatus* (DEFLANDRE et FERT) REINHARDT, 1966a
Watznaueria ? parvidentata (DEFLANDRE et FERT) BUKRY, 1969
Reticulofenestra ? parvidentata (DEFLANDRE et FERT) NOËL, 1970
3. *Cribrosphaerella polygonata* (GÓRKA) LYUL'eva, 1967b
Discolithina ? polygonata (GÓRKA) BUKRY, 1969
4. *Zygodiscus ponticulus* (DEFLANDRE) REINHARDT, 1966a
Zycolithus ponticulus (DEFLANDRE) MANIVIT, 1965
5. *Deflandrius propinquus* (GÓRKA) GÓRKA et REINHARDT, 1967
Prediscosphaera propinqua (GÓRKA) REINHARDT, 1970b
6. *Cretarhabdus romani* (GÓRKA) STRADNER et al., 1968
Cretarhabdus surirellus (DEFLANDRE et FERT) REINHARDT, 1970
Dodekapodorhabdus regularis (CARATINI) PERCH-NIELSEN, 1968a
7. *Discolithus variatus* CARATINI, 1964
Zycolithus diplogrammus DEFLANDRE, 1954
8. *Cribrosphaerella rudis* (GÓRKA) GÓRKA et REINHARDT, 1967
9. *Arkhangelskiella obliqua* STRADNER, 1963
Arkhangelskiella ornamenta (CARATINI) PERCH-NIELSEN, 1968a
Laffittius obliquus (REINHARDT) NOËL, 1969
Gartnerago obliquus (STRADNER) NOËL, 1970a
10. *Cretarhabdus surirellus* (DEFLANDRE et FERT) REINHARDT, 1970b
11. *Discolithus ponticulus* (DEFLANDRE, 1954
Zygodiscus theta (BLACK), BUKRY, 1969
Discolithina theta (BLACK) FORCHHEIMER, 1970
12. *Zycolithus trabalis* (GÓRKA) TREXLER, 1967
13. *Eiffellithus trabeculatus* (GÓRKA) REINHARDT et GÓRKA, 1967
14. *Eiffellithus transformis* (GÓRKA) GÓRKA et REINHARDT, 1967
Zycolithus transformis (GÓRKA) LYUL'eva, 1969
15. *Rhagodiscus asper* (STRADNER) REINHARDT, 1967
Rhagodiscus vagus STOVER, 1966
16. *Cribrosphaera ehrenbergi* ARKHANGELSKY, 1912
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
17. *Eiffellithus eximius* (STOVER) PERCH-NIELSEN, 1968
18. *Eiffellithus turriseiffeli* (DEFLANDRE) REINHARDT, 1965
19. *Eiffellithus trabeculatus* (GÓRKA) REINHARDT et GÓRKA, 1967
20. *Eiffellithus anceps* (GÓRKA) REINHARDT et GÓRKA, 1967
Zycolithus turriseiffeli DEFLANDRE, 1954
Zygrhablithus turriseiffeli (DEFLANDRE) DEFLANDRE, 1959
Rhabdolithus turriseiffeli (DEFLANDRE) STRADNER, 1963
21. *Vekshinella acutiferra* (VEKSHINA) LOEBLICH et TAPPAN, 1963
22. *Cretarhabdus camaratus* (BUKRY) REINHARDT, 1970b
23. *Cribrosphaerella hilli* (BLACK) REINHARDT, 1967
Cribrosphaera ehrenbergi ARKHANGELSKY, 1912
Cribrosphaera hilli (BLACK) HOFFMAN, 1970b
24. *Cribrosphaera laughtoni* (BLACK) BUKRY, 1969
Cribrosphaerella ehrenbergi (ARKHANGELSKY) DEFLANDRE, 1954
Cribrosphaera arkhangelskii (SHUMENKO) REINHARDT et GÓRKA, 1967
25. *Cribrosphaerella ehrenbergi* (ARKHANGELSKY) DEFLANDRE, 1954
Cribrosphaera hilli (BLACK) HOFFMAN, 1970b
Cribrosphaera matthewsi (BLACK) REINHARDT, 1966
Cribrosphaerella matthewsi (BLACK) REINHARDT, 1966

SYNONYMS (TABLE 7)

1. *Arkhangelskiella concava* GARTNER, 1968
2. *Zycolithus diplogrammus* DEFLANDRE, 1954
Zygodiscus spiralis BRAMLETTE et MARTINI, 1964
Placozygus fibuliformis (REINHARDT) HOFFMAN, 1970c
3. *Sollasites wallacei* (BUKRY) REINHARDT, 1970b
4. *Crepidolithus minimus* (REINHARDT) REINHARDT, 1970b
5. *Kamptnerius magnificus* DEFLANDRE, 1959
6. *Kamptnerius magnificus* DEFLANDRE, 1959
7. *Eprolithus floralis* (STRADNER) STOVER, 1966
8. *Lithastrinus floralis* STRADNER, 1962b
9. *Lithraphidites quadratus* BRAMLETTE et MARTINI, 1964
10. *Lucianorhabdus cayeuxi* DEFLANDRE, 1959

SYNONYMS (TABLE 8)

1. *Lithraphidites helicoides* (DEFLANDRE) DEFLANDRE, 1963
2. *Microrhabdulus belgicus* HAY et TOWE, 1963
3. *Microrhabdulus belgicus* HAY et TOWE, 1963
4. *Micula staurophora* (GARDET) STRADNER, 1963
Micula staurophora decussata (VEKSHINA) NOËL, 1970
5. *Micula staurophora* (GARDET) STRADNER, 1963
Micula decussata concava (STRADNER) BUKRY, 1969
Micula decussata VEKSHINA, 1959
6. *Nephrolithus frequens* GÓRKA, 1957

SYNONYMS (TABLE 9)

1. *Zycolithus diplogrammus* DEFLANDRE, 1954
2. *Rhabdolithina angusta* (STRADNER) REINHARDT, 1967
Parhabdolithus angustus (STRADNER) STRADNER, 1967a
3. *Rhabdolithina splendens* (DEFLANDRE) REINHARDT, 1967
4. *Podorhabdus dietzmanni* (REINHARDT) REINHARDT, 1967
5. *Cretarhabdus quadriperforatus* (BUKRY) REINHARDT, 1970b
6. *Lithastrinus floralis* STRADNER, 1962b
7. *Prediscosphaera cretacea* (ARKHANGELSKY) GARTNER, 1968
8. *Prediscosphaera quadripunctata* (GÓRKA) REINHARDT, 1970b
9. *Podorhabdus dietzmanni* (REINHARDT) REINHARDT, 1967
Staurolithites orbiculofenestrus (GARTNER) CEPEK et HAY, 1969
10. *Lithastrinus floralis* STRADNER, 1962b
Lithastrinus planus (STOVER) LYUL'EVA, 1967
11. *Ahmuellerella angusta* (STRADNER) REINHARDT, 1965
Rhabdolithina angusta (STRADNER) REINHARDT, 1967
Parhabdolithus angustus (STRADNER) BUKRY, 1969
12. *Cretarhabdus anthoporus* (DEFLANDRE) BRAMLETTE et MARTINI, 1964
Chiastozygus anthoporus (DEFLANDRE) GARTNER, 1968
Reinhardtites anthoporus (DEFLANDRE) PERCH-NIELSEN, 1968a
Rhabdolithina anthopora (DEFLANDRE) REINHARDT, 1967
13. *Cretarhabdus surirella* (DEFLANDRE et FERT) SHUMENKO, 1969b
14. *Eiffellithus cretaceus* subsp. *intercicus* (DEFLANDRE) REINHARDT, 1965
Zygrhablithus intercicus (DEFLANDRE) DEFLANDRE, 1959
Deflandrius intercicus (DEFLANDRE) BRAMLETTE et MARTINI, 1964
Deflandrius cretaceus intercicus (DEFLANDRE) REINHARDT, 1966a
Prediscosphaera cretacea (ARKHANGELSKY) GARTNER, 1968
Deflandrius cretaceus (ARKHANGELSKY) BRAMLETTE et MARTINI, 1964
15. *Rhabdolithina splendens* (DEFLANDRE) REINHARDT, 1967
16. *Zycolithus turriseiffeli* DEFLANDRE, 1954
Eiffellithus turriseiffeli (DEFLANDRE) REINHARDT, 1965
Zygrhablithus turriseiffeli (DEFLANDRE) DEFLANDRE, 1959

SYNONYMS (TABLE 10)

1. *Lithastrinus grilli* STRADNER, 1962b
2. *Coccolithus horticus* STRADNER et al., 1966
3. *Cretarhabdus conicus* BRAMLETTE et MARTINI, 1964
Cretarhabdus surirellus (DEFLANDRE et FERT) REINHARDT, 1970b
4. *Tetralithus nitidus trifidus* (STRADNER) BUKRY et BRAMLETTE, 1969b
5. *Zycolithus exiguus* (STOVER) MANIVIT, 1968
Zycolithus diplogrammus DEFLANDRE, 1954
6. *Zycolithus phacelosus* (STOVER) MANIVIT, 1968
7. *Zygodiscus phacelosus* (STOVER) BUKRY, 1969
8. *Coccolithus barnesae* (BLACK) BRAMLETTE et MARTINI, 1964
Tergestiella barnesae (BLACK) REINHARDT, 1964
Colvillea barnesae (BLACK) BLACK, 1964
Watznaueria barnesae (BLACK) PERCH-NIELSEN, 1968a
9. *Coccolithus burwellensis* (BLACK) STRADNER, 1965
Dictyococcites burwelensis (BLACK) BLACK, 1967a
Coccolithus parvidentatus (DEFLANDRE et FERT) REINHARDT, 1966
Reticulofenestra ? *parvidentata* (DEFLANDRE et FERT) NOËL, 1970
10. *Biscutum melaniae* (GÓRKA) REINHARDT, 1969
11. *Biscutum ignotum* (GÓRKA) REINHARDT et GÓRKA, 1967
Cyatholithus ignotus (GÓRKA) TREXLER, 1967
Discorhabdus ignotus (GÓRKA) PERCH-NIESEN, 1968a
12. *Watznaueria melaniae* (GÓRKA) REINHARDT et GÓRKA, 1967
Biscutum constans (GÓRKA) BLACK, 1967
Biscutum melaniae (GÓRKA) REINHARDT, 1969

SYNONYMS (TABLE 11)

1. *Discorhabdus ignotus* (GÓRKA) PERCH-NIELSEN, 1968a
Biscutum ignotum (GÓRKA) REINHARDT et GÓRKA, 1967
2. *Discorhabdus ignotus* (GÓRKA) PERCH-NIELSEN, 1968a
Biscutum ignotum (GÓRKA) REINHARDT et GÓRKA, 1967
3. *Prediscosphaera spinosa* (BRAMLETTE et MARTINI) GARTNER, 1968
Deflandrius quadripunctatus (GÓRKA) REINHARDT et GÓRKA, 1967
Prediscosphaera quadripunctata (GÓRKA) REINHARDT, 1970b
4. *Ahmuellerella regularis* (GÓRKA) REINHARDT et GÓRKA, 1967
Cretarhabdus regularis (GÓRKA) LYUL'eva, 1967b
Eiffellithus regularis (GÓRKA) PERCH-NIELSEN, 1968b
Parhabdolithus regularis (GÓRKA) BUKRY, 1969
Actinozygus regularis (GÓRKA) GARTNER, 1968
5. *Biscutum melaniae* (GÓRKA) REINHARDT, 1969
6. *Cretarhabdus surirella* (DEFLANDRE et FERT) SHUMENKO, 1969b
Cretarhabdus romani (GÓRKA) STRADNER, et al., 1968
7. *Discorhabdus ignotus* (GÓRKA) PERCH-NIELSEN, 1968a
Biscutum ignotum (GÓRKA) REINHARDT et GÓRKA, 1967
Cyatolithus similis (GÓRKA) TREXLER, 1967
8. *Eiffellithus bochothnicae* (GÓRKA) REINHARDT et GÓRKA, 1967
9. *Eiffellithus trabeculatus* (GÓRKA) REINHARDT et GÓRKA, 1967
10. *Pontilithus dentatus* (BUKRY) REINHARDT, 1970b
11. *Vagalapilla elliptica* (GARTNER) BUKRY, 1969
12. *Vagalapilla imbricata imbricata* BUKRY, 1969
13. *Cretarhabdus schizobrachiatus* (GARTNER) BUKRY, 1969
14. *Coccolithus barnesae* (BLACK) BRAMLETTE et MARTINI, 1964
Watznaueria barnesae (BLACK) PERCH-NIELSEN, 1968a
15. *Biscutum minimum* (REINHARDT et GÓRKA) REINHARDT, 1970a
16. *Zygodiscus acanthus* (REINHARDT) REINHARDT, 1966a
17. *Zygrhablithus amphipons* (BRAMLETTE et MARTINI) LYUL'eva, 1967
Eiffellithus anceps (GÓRKA) REINHARDT et GÓRKA, 1967
Zygolithus litterarius (GÓRKA) STRADNER et al., 1968
18. *Rhabdolithina anthopora* (DEFLANDRE) REINHARDT, 1967a
19. *Zygolithus compactus* (BUKRY) NOËL, 1970a
20. *Placozygus fibuliformis* (REINHARDT) HOFFMAN, 1970c

SYNONYMS (TABLE 12)

1. *Placozygus spiralis* (BRAMLETTE et MARTINI) HOFFMAN, 1970c
2. *Zygodolites achylosus* (STOVER) STRADNER et al., 1968
3. *Zygodolites crux* (DEFLANDRE et FERT) BRAMLETTE et SULLIVAN, 1961
Eiffellithus biramiculatus (STOVER) HOFFMAN, 1967b
Eiffellithus bochothnicae (GÓRKA) REINHARDT et GÓRKA, 1967
Ahmuellerella biramiculata (STOVER) HOFFMAN, 1970c
4. *Chiastozygus cuneatus* (LYUL'eva) CEPEK et HAY, 1969
5. *Corollithion delftensis* (STRADNER et ADAMIKER) BUKRY et BRAMLETTE, 1969b
6. *Actinozygus ? fenestratus* (STOVER) GARTNER, 1968
Cretarhabdus romani (GÓRKA) STRADNER et al., 1968
Dodekapodorhabdus fenestratus (STOVER) PERCH-NIELSEN, 1968
7. *Discolithus polonicus* (GÓRKA) STRADNER, 1963
Eiffellithus bochothnicae (GÓRKA) REINHARDT et GÓRKA, 1967
8. *Corollithion rhombicum* (STRADNER et ADAMIKER) BUKRY, 1969
9. *Zygodolites diplogrammus* DEFLANDRE, 1954
10. *Eiffellithus turriseiffeli* (DEFLANDRE) REINHARDT, 1965
Rhabdolites turriseiffeli (DEFLANDRE) STRADNER, 1963
Zygrhablithus turriseiffeli (DEFLANDRE) DEFLANDRE, 1959
Clinorhabdus turriseiffeli (DEFLANDRE) STOVER, 1966
Staurolithites turriseiffeli (DEFLANDRE) SHUMENKO, 1968a
11. *Prediscosphaera cretacea* (ARKHANGELSKY) GARTNER, 1968
12. *Zygodolites diplogrammus* DEFLANDRE, 1954
13. *Tetralithus aculeus* (STRADNER) BUKRY et KENNEDY, 1969

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