Publicación Electrónica
ASOCIACIÓN PALEONTOLÓGICA ARGENTINA

www.peapaleontologica.org.ar

Cretaceous microfossil (foraminifera and calcareous nannofossils) assemblages from the subsurface Magallanes Basin, Tierra del Fuego Island, Chile

JENS MICHAEL THISSEN[1]
JUAN PABLO PÉREZ PANERA[2]

1. Laboratorio de Bioestratigrafía, YPF Tecnología. Av. del Petróleo s/n, 1923 Berisso, Buenos Aires, Argentina.
2. Laboratorio de Bioestratigrafía, CONICET – YPF Tecnología. Av. del Petróleo s/n, 1923 Berisso, Buenos Aires, Argentina.

Recibido: 8 de mayo 2020 - **Aceptado:** 24 de septiembre 2020 - **Publicado:** 9 de diciembre 2020

Para citar este artículo: Jens Michael Thissen and Juan Pablo Pérez Panera (2020). Cretaceous microfossil (foraminifera and calcareous nannofossils) assemblages from the subsurface Magallanes Basin, Tierra del Fuego Island, Chile. *Publicación Electrónica de la Asociación Paleontológica Argentina* 20 (2): 83–138.

Link a este artículo: http://dx.doi.org/10.5710/PEAPA.24.09.2020.342

ISSN 2469-0228

Asociación Paleontológica Argentina
Maipú 645 1° piso, C1006ACG, Buenos Aires
República Argentina
Tel/Fax (54-11) 4326-7563
Web: www.apaleontologica.org.ar

PeAPA | Publicación Electrónica
ASOCIACIÓN PALEONTOLÓGICA ARGENTINA
Año 2020 - 20(2): 83–138 ARTÍCULO

CRETACEOUS MICROFOSSIL (FORAMINIFERA AND CALCAREOUS NANNOFOSSILS) ASSEMBLAGES FROM THE SUBSURFACE MAGALLANES BASIN, TIERRA DEL FUEGO ISLAND, CHILE

JENS MICHAEL THISSEN[1] AND JUAN PABLO PÉREZ PANERA[2]

[1]Laboratorio de Bioestratigrafía, YPF Tecnología. Av. del Petróleo s/n, 1923 Berisso, Buenos Aires, Argentina. *jens.m.thissen@ypftecnologia.com*
[2]Laboratorio de Bioestratigrafía, CONICET – YPF Tecnología. Av. del Petróleo s/n, 1923 Berisso, Buenos Aires, Argentina. *juan.p.panera@ypftecnologia.com*

JMT: https://orcid.org/0000-0001-6709-1187; **JPPP:** https://orcid.org/0000-0002-2326-0732

Abstract. Foraminifera and calcareous nannofossils were studied in washed drill-cuttings of three wells from the Chilean sector of the Magallanes Basin. This contribution aims to identify, characterize and illustrate microfossil assemblages throughout the Cretaceous sedimentary record to integrate foraminiferal and the nannofossil data and improve further biostratigraphic studies in the basin. The analyzed Cretaceous succession in these wells corresponds to five discrete foraminiferal and nannofossil assemblages, which were recognized and are described here. The Valanginian–Hauterivian assemblage is characterized by a low diversity of benthic foraminifera typical of this age, like *Lenticulina nodosa* and *Astacolus gibber,* and nannofossil markers *Lithraphidites bollii* and *Eiffellithus striatus*; then, the Aptian–Albian begins with a predominance of radiolarians and transitions into a highly diverse assemblage comprising mainly gavelinellid benthics as well as abundant planktic foraminifera, which include *Muricohedbergella delrioensis* and *M. portsdownensis,* and diverse calcareous nannofossils with the marker *Sollasites falklandensis*. The Cenomanian can be distinguished by the presence of the nannofossil *Corollithion kennedyi* and also abundant planktic foraminifers; whilst the Coniacian–Campanian assemblage is characterized by planktic foraminifera like *Costellagerina bulbosa, C. pilula,* and *Planoheterohelix reussi*, as well as a diverse benthos and the nannofossil species *Reinhardtites anthophorus*, *Eiffellithus eximius,* and *Eprolithus floralis*. Finally, the Maastrichtian assemblage is characterized by mainly agglutinated foraminifera and few poorly preserved nannofossils. A detailed systematic list of both foraminiferal and nannofossil species is presented, intended to serve as a catalogue that will help to identify the different Cretaceous assemblages of the basin in future studies.

Key words. Foraminifera. Nannofossils. Mesozoic. Austral Basin. Taxonomy.

Resumen. ENSAMBLES DE MICROFÓSILES (FORAMINÍFEROS Y NANOFÓSILES CALCÁREOS) CRETÁCICOS DEL SUBSUELO DE LA CUENCA DE MAGALLANES, ISLA DE TIERRA DEL FUEGO, CHILE. Se estudiaron los foraminíferos y nanofósiles calcáreos en muestras de recorte de perforación lavados de tres pozos del sector chileno de la Cuenca de Magallanes. El objetivo de esta contribución es identificar, caracterizar e ilustrar estos ensambles a lo largo del registro sedimentológico cretácico, integrar los datos de los foraminíferos y nanofósiles y optimar futuros estudios bioestratigráficos en la cuenca. La sucesión cretácica analizada en los tres pozos permitió reconocer cinco ensambles discretos: el ensamble del Valanginiano–Hauteriviano está caracterizado por una baja diversidad de foraminíferos bentónicos típicos de esta edad, como *Lenticulina nodosa* y *Astacolus gibber,* y los nanofósiles marcadores *Lithraphidites bollii* y *Eiffellithus striatus*; el Aptiano–Albiano comienza con una predominancia de radiolarios en transición a foraminíferos bentónicos bien preservados y altamente diversos, principalmente gavelinélidos, junto con abundantes foraminíferos planctónicos incluyendo *Muricohedbergella delrioensis* y *M. portsdownensis* y muy diversos nanofósiles calcáreos con el marcador *Sollasites falklandensis*; el Cenomaniano se puede distinguir por la presencia del nanofósil *Corollithion kennedyi* y también abundantes foraminíferos planctónicos; el ensamble del Coniaciano–Campaniano está caracterizado por foraminíferos planctónicos como *Costellagerina bulbosa, C. pilula* y *Planoheterohelix reussi,* así como gran diversidad de bentónicos y las especies de nanofósiles *Reinhardtites anthophorus, Eiffellithus eximius* y *Eprolithus floralis*; y finalmente el ensamble del Maastrichtiano está caracterizado principalmente por foraminíferos aglutinados y nanofósiles calcáreos muy mal preservados y poco abundantes. Se presenta una detallada lista sistemática de las especies identificadas que servirá como catálogo para la identificación de estos diferentes ensambles cretácicos en futuros trabajos en esta cuenca.

Palabras clave. Foraminíferos. Nanofósiles. Mesozoico. Cuenca Austral. Taxonomía.

THE MAGALLANES or Austral Basin (as known in the Argentinian sector) is one of the most prolific depositional environments in the southernmost part of South America and is of particular interest for hydrocarbon exploration. The Magallanes Basin began as an extensive basin during the Triassic and evolved during the Jurassic with the opening of a small

marginal sea behind a developing magmatic arc that closed in the middle Cretaceous (Biddle *et al.*, 1986; Robbiano *et al.*, 1996; Nullo *et al.,* 1999; Malumián, 1999; Ramos, 2002; Rodríguez & Miller, 2005). Since the Late Cretaceous and during the Cenozoic, it transformed into a foreland basin (Malumián *et al.,* 2013). Due to its location, the basin is important for understanding the orogeny of the southern and Fuegian Andes, and the connection of South America with Antarctica. Furthermore, it represents an important archive of the diversity and evolution of foraminifera and calcareous nannofossils in southern high latitudes.

In this contribution, we have studied the faunal composition of foraminifera and calcareous nannofossil assemblages from three wells' cutting samples of the Cretaceous succession in the Chilean sector of the Isla Grande de Tierra del Fuego. The objective of this study is to identify, characterize, and illustrate microfossil assemblages integrating foraminiferal and nannofossil data to improve biostratigraphic studies in the basin. For reasons of confidentiality, the wells will simply be referred to as West, North, and East, according to their relative geographical location in the study area (Fig. 1). The analyses of the Cenozoic succession of these wells are to be presented in a separate contribution.

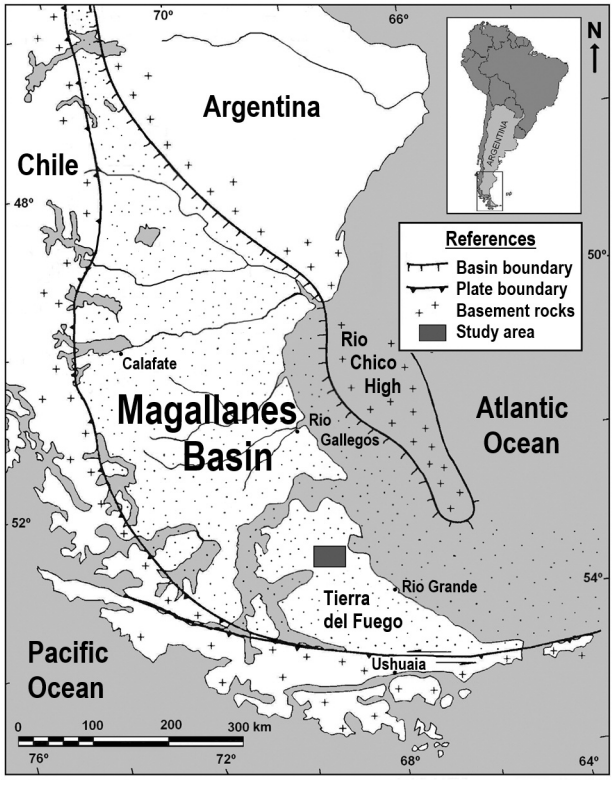

Figure 1. Map of the Austral Basin and the study area on Tierra del Fuego Island.

MATERIAL AND METHODS

A total of 98 samples of washed well cuttings were processed and analyzed for foraminiferal and calcareous nannofossil investigation. The samples were processed according to the standard methodologies for this type of analysis, which are detailed below for each discipline. The recovered material and nannofossil fertile slides are housed in the Y-TEC Laboratory of Biostratigraphy Micropaleontological Repository under the acronym YT.RMP_M (Y-TEC Repositorio Micropaleontológico. Microfósiles) and numbers 000011.42 to 000011.60 (West well), 000008.32 to 000008.49 (North well), 000010.35 to 000010.49 (East well) for foraminifera; and YT.RMP_N (Y-TEC Repositorio Micropaleontológico. Nanofósiles) numbers 000011.46 to 000011.58 (West well), 000008.33 to 000008.55 (North well), 000010.29 to 000010.38 (East well) for calcareous nannofossils.

All the foraminifera present, as well as other microfossils of interest, were extracted through the picking technique and arranged into slides for determination. To determine the foraminiferal fauna, references were compiled for the study area and related areas. The generic classification by Loeblich & Tappan (1987, 1992) and the Catalog of Foraminifera by Ellis & Messina (1940 and subsequent) were used. For detailed analyses and to obtain high definition photographs, a FEI Quanta 200 Scanning Electron Microscope was used. Indeterminable specimens were classified by their wall structure and *modus vivendi* (agglutinated, calcareous, and planktic taxa) (Murray, 1991).

For nannofossil analysis, a simplified gravity settling technique was carried out (Gardet, 1955; Bramlette & Sullivan, 1961). For the systematic determination of the taxa, general and specific bibliography was used, and the taxonomic scheme by Bown & Young (1997) and Young & Bown (1997) was applied. For each sample, at least 300 individuals or 450 Fields of View (FoV) in samples where calcareous nannofossils presented low abundance, were examined.

GEOLOGICAL HISTORY

The Magallanes Basin is a vast sedimentary structure located between the Andean Cordillera to the west and the Río Chico High on the Patagonian Shelf to the east (Nullo *et al.,* 1999) (Fig. 1). Together with the adjacent offshore Malvinas Basin, it developed near a complex tectonic area, which was highly affected by interaction processes between the South American, Scotia, and Antarctic plates (Galeazzi, 1998). These tectonic activities led to the extensive deposition of volcaniclastic rocks of the Jurassic Tobífera Series (Natland & González, 1974), which marks the syn-rift phase of the basin's evolution (Sachse *et al.,* 2015). The overlying mainly marine sedimentary sequence of Early Cretaceous to Miocene age, which reaches a maximum thickness of up to 7,000 m (Galeazzi, 1998), originates in the break-up of Gondwana and the opening of the South Atlantic Ocean (Peroni *et al.,* 2002). During the Late Cretaceous, the Magallanes Basin transformed into a foreland basin that accumulated mainly fine-grained sediments of the *Inoceramus*-strata (Olivero & Malumián, 2008; Sachse *et al.,* 2015). Since the Maastrichtian, the basin was subject to several transgression-regression cycles, with the main Atlantic transgressions occurring during the Maastrichtian–Danian, the middle Eocene, the late Oligocene–early Miocene, and the middle Miocene (Malumián & Náñez, 2011; Pérez Panera, 2013).

PREVIOUS STUDIES

Malumián (1968) was the first to compile a complete biostratigraphic interpretation of a well from the Province of Santa Cruz, southern Argentina. Flores *et al.* (1973) established a Cretaceous stratigraphy of the Magallanes Basin based on foraminifera. Natland *et al.* (1974) summarized the analyses of several sedimentary sequences from the Chilean sector of the basin in their "system of stages". Malumián & Masiuk (1975, 1976a, 1976b, 1978), as well as Malumián & Náñez (1983, 1990), Kielbowicz *et al.* (1983), and Pérez Panera (2012a) intensified the knowledge of foraminiferal and calcareous nannofossil assemblages from the Cretaceous of the Magallanes Basin by providing detailed studies, each focusing on a single formation or taxonomic group. Most of these were synthesized in Malumián (1990). Finally, Ronchi & Angelozzi (1994), Malumián & Caramés (1997), Concheyro & Angelozzi (2002), Malumián & Jannou (2010), Malumián & Náñez (2011), Pérez Panera (2013), and González Estebenet *et al.* (2020) compiled integrated biostratigraphic and paleoecological studies of the basin's marine sediments from the Lower Cretaceous to the Miocene. However, no integrated systematic analysis of foraminifera and calcareous nannofossils from the entire Cretaceous record of the Magallanes basin has been assembled yet.

RESULTS

Due to the nature of the studied material, which consists of drill-cuttings, the results are presented from the top to the bottom of the wells. Assemblages were identified by the occurrences of marker species (especially planktic foraminifera and calcareous nannofossils). Microfossil preservation and abundances were highly varying between samples and wells. Five discrete assemblages were identified in the three wells. The most representative microfaunal elements of the analyzed succession are illustrated in Figures 2 to 7.

The Maastrichtian assemblage was recognized in all three wells but is very indistinct from the overlying Danian. The foraminifera are mainly represented by indeterminable agglutinated forms. The only calcareous foraminifer identified was a specimen of *Alabamina australis* in the East well (Fig. 3). In the West well, this section is sterile of foraminifera, but a few radiolarians were found (which might have been caved from the lower Eocene). The nannofossil assemblage shows poor preservation, low abundance, and low diversity. Contamination due to caving processes was recognized (mostly reticulofenestrids from Eocene intervals). However, some species marking the Maastrichtian could be identified: *Arkhangelskiella cymbiformis*, *Calculites obscurus*, *Quadrum gartneri*, and *Micula staurophora* indicate an uppermost Cretaceous age (Figs. 6–7).

The Coniacian–Campanian assemblage was recognized in all three wells, with a recovered microfaunal content that displays moderate to good preservation and high species richness. Typical species include *Lenticulina muensteri*, *Saracenaria triangularis*, *Gaudryina pyramidata*, *Anomalinoides murchisonensis*, *Gavelinella eriksdalensis*, and *Gyroidina exserta* (Figs. 2–3). *Costellagerina pilula*, *C. bulbosa*, *Globigerinelloides*

asper, *Whiteinella baltica*, and *Archaeoglobigerina* sp. are the planktic species (Figs. 2–3) that restrict this section to a Coniacian–Campanian age. Nannofossil assemblages recovered in this interval show a moderate abundance and high diversity. The last occurrences (LO) of the markers *Eiffellithus eximius*, *Reinhardtites anthophorus*, and *Seribiscutum primitivum* allow the interpretation of Campanian age (Figs. 4–5). Other recovered species within this section are *Zeugrhabdotus scutula*, *Z. diplogrammus*, *Helicolithus turonicus*, *Eiffellithus turriseiffellii*, *E. gorkae*, *Ahmuellerella octoradiata*, *Micula concava*, *Eprolithus moratus*, and *E. floralis* (Figs. 4–7). The LO of *Rhagodiscus achlyostaurion* and the presence of *Biscutum magnum* support a Santonian age for the middle part. *Micula adumbrata* and *M. staurophora*, together with the presence of the austral marker species *Chiastozygus stylesii* and *Thiersteina ecclesiastica* at the base of this interval suggest a deposition during the Coniacian (Figs. 4, 7).

The Cenomanian was recognized in the North and East wells. Lying below an unconformity, evidenced by the absence of Turonian sediments, this section yields high abundance and moderate diversity assemblages with moderate to poor preservation. The foraminifera in this section are mainly represented by the very abundant planktic species *Muricohedbergella delrioensis*, *M. planispira*, and *M. portsdownensis*. The LO of the nannofossil species *Axopodorhabdus albianus* and the presence of the marker species *Corollithion kennedyi* indicate a Cenomanian age.

The Aptian–Albian assemblage was recognized in all three wells and is distinguished from the Cenomanian by the above-mentioned nannofossil marker. The most abundant planktic foraminifera in this section are again *Muricohedbergella delrioensis*, *M. planispira*, and *M. portsdownensis* (Fig. 3). As for the benthic members, typical Albian forms of the Magallanes Basin were found, such as *Lingulogavelinella magallanica*, *L. globosa*, *Anomalina cenomanica*, *Gavelinella berthelini*, *Dorothia mordojovichi*, and *Spiroplectinata annectens*, among others (Figs. 2–3). In the West well, the foraminifera were poorly represented in this section. However, there are abundant radiolarians, especially in the lower levels. The dominance of radiolarians is typical for the Aptian in the Magallanes Basin (Flores *et al.*, 1973). The nannofossil assemblage is characterized by a high abundance, mainly due to *Watznaueria barnesae,* high species richness, and moderate preservation (Fig. 6). The LO of *Gartnerago stenostaurion* in the upper part marks the top of the Albian. The presence of the high latitude marker species *Sollasites falklandensis* marks the CC8 biozone of early–middle Albian age in the Magallanes Basin (Pérez Panera, 2011, 2012a). At the base of the interval, the dissolution-resistant species *Watznaueria barnesae* and *W. fossacincta* dominate the assemblage (Fig. 6). The presence of *Diloma primitiva,* a decrease in the overall diversity, as well as an abundance of organic material in the lower levels, suggests an age not younger than early Aptian (see Flores *et al.*, 1973).

The Valanginian–Hauterivian assemblage was recognized in all three wells below another unconformity, evidenced by the absence of Barremian sediments, and marks a distinct faunal and environmental turnover. The fauna of this section displays a very low diversity, characterized by exclusively benthic foraminiferal species like *Lenticulina nodosa*, *Astacolus gibber*, *Polymorphina martinezi*, *Lenticulina praegaultina*, and *Epistomina caracolla* (Fig. 2). This assemblage of benthic foraminifera is characteristic of Valanginian–Hauterivian sediments. The nannofossil assemblage displays poor to moderate preservation and moderate abundance with low diversity. The presence of the species *Diloma primitiva*, *Lithraphidites bollii,* and *Eiffellithus striatus* also indicate a Valanginian–Hauterivian age for this section (Figs. 4, 6). At the base, some poorly preserved nannofossils were recovered, but they are considered contamination from upper levels.

SYSTEMATIC PALEONTOLOGY

Kingdom CHROMISTA Cavalier-Smith, 1981
Phylum FORAMINIFERA d'Orbigny, 1826
Class MONOTHALAMEA Haeckel, 1862
Order ASTRORHIZIDA Lankester, 1885
Suborder SACCAMMININA Lankester, 1885
Superfamily PSAMMOSPHAEROIDEA Haeckel, 1894
Family PSAMMOSPHAERIDAE Haeckel, 1894
Subfamily PSAMMOSPHAERINAE Haeckel, 1894

Genus ***Psammosphaera*** Schultze, 1875

Type species. *Psammosphaera fusca* Schultze, 1875. Middle Ordovician to Holocene; cosmopolitan.

Psammosphaera sp.

Occurrence. Albian (North well).

Class TUBOTHALAMEA Pawlowski, Holzman, & Tyszka, 2013
Order SPIRILLINIDA Hohenegger & Piller, 1975
Suborder AMMODISCINA Mikhalevich, 1980
Superfamily AMMODISCOIDEA Chapman, Parr, & Collins, 1934
Family AMMODISCIDAE Reuss, 1862
Subfamily AMMODISCINAE Reuss, 1862

Genus ***Ammodiscus*** Reuss, 1862

Type species. *Involutina silicea* Terquem, 1862. Silurian to Holocene; cosmopolitan.

Ammodiscus cretaceus (Reuss, 1845)
Figure 2.1

1845 *Operculina cretacea* – Reuss, p. 35, pl. 13, figs. 64, 65a–b.
1946 *Ammodiscus cretaceus* (Reuss) – Cushman, p.17, pl. 1, fig. 35.
1968 *Ammodiscus cretaceus* (Reuss) – Sliter, p. 42, pl. 1, fig. 8.
1976b *Ammodiscus cretaceus* (Reuss) – Malumián & Masiuk, p. 184, pl. 1, fig. 8.
1983 *Ammodiscus cretaceus* (Reuss) – Basov & Krasheninnikov, p. 760, pl. 5, fig. 3.

Occurrence. Coniacian–Campanian (West and East wells).

Ammodiscus siliceus (Terquem, 1862)

1862 *Involutina silicea* – Terquem, p. 450, pl. 6, fig. 11.
1990 *Ammodiscus siliceus* (Terquem) – Malumián & Náñez, p. 516, pl. 1, figs. 6–8.

Occurrence. Coniacian–Campanian (North well).

Ammodiscus sp.

Occurrence. Maastrichtian (East well).

Subfamily USBEKISTANIINAE Vyalov, 1968

Genus ***Glomospira*** Rzehak, 1885

Type species. *Trochammina squamata* var. *gordialis* Jones & Parker, 1860. Upper Mississippian to Holocene; cosmopolitan.

Glomospira charoides (Jones & Parker, 1860)
Figure 2.2

1860 *Trochammina squamata* var. *charoides* – Jones & Parker, p. 304.
1946 *Glomospira charoides* (Jones & Parker) var. *corona* Cushman & Jarvis – Cushman, p. 19, pl. 2, figs. 1–3.

Occurrence. Coniacian–Campanian (West and North wells), Albian–Campanian (East well).

Order MILIOLIDA Delage & Hérouard, 1896
Suborder MILIOLINA Delage & Hérouard, 1896
Superfamily MILIOLOIDEA Ehrenberg, 1839
Family HAUERINIDAE Schwager, 1876
Subfamily MILIOLINELLINAE Vella, 1957

Genus ***Pseudosigmoilina*** Bartenstein, 1965

Type species. *Quinqueloculina infravalanginiana* Bartenstein, 1962. Cretaceous; Europe, South America.

Pseudosigmoilina cf. ***Q. antiqua*** (Franke, 1928)
Figure 2.3

cf. 1928 *Miliolina* (*Quinqueloculina*) *antiqua* – Franke, p. 126, pl. 11, fig. 26.
1976b *Pseudosigmoilina* cf. *Q. antiqua* (Franke) – Malumián & Masiuk, p. 188, pl. 2, fig. 5.

Remarks. The classification here follows the description by Malumián & Masiuk (1976b) who related their specimens to *Quinqueloculina antiqua* (Franke, 1928) (see also Hayward *et al.*, 2018) but left an open taxonomy because, like in this study, they did not observe any dental elements in the aperture. In case this is not due to preservational causes, it cannot be classified as *Quinqueloculina* but must be placed under *Pseudosigmoilina*.

Occurrence. Coniacian–Campanian (West, North, and East wells).

Class NODOSARIATA Mikhalevich, 1992, *emend.* Rigaud *et al.*, 2015

Subclass NODOSARIANA Mikhalevich, 1992

Order NODOSARIIDA Calkins, 1926

Suborder NODOSARIINA Calkins, 1926

Superfamily NODOSARIOIDEA Ehrenberg, 1838

Family NODOSARIIDAE Ehrenberg, 1838

Subfamily LINGULININAE Loeblich & Tappan, 1961

Genus ***Lingulonodosaria*** Silvestri, 1903

Type species. *Lingulina nodosaria* Reuss, 1863. Lower Permian to Lower Cretaceous; cosmopolitan.

Lingulonodosaria nodosaria (Reuss, 1863)

1863 *Lingulina nodosaria* – Reuss, p. 59, pl. 5, fig. 12.
1983 *Lingulina nodosaria* Reuss – Basov & Krasheninnikov, p. 761, pl. 1, figs. 11–12.
1983 *Lingulina nodosaria* Reuss – Malumián & Náñez, p. 378, pl. 1, fig. 18.
1987 *Lingulonodosaria nodosaria* (Reuss) – Loeblich & Tappan, p. 390, pl. 433, figs. 13–16; pl. 434, figs. 1–11.

Occurrence. Albian (East well).

Subfamily NODOSARIINAE Ehrenberg, 1838

Genus ***Dentalina*** Risso, 1826

Type species. *Nodosaria cuvieri* d'Orbigny, 1826. Upper Jurassic to Holocene; cosmopolitan.

Dentalina spp.

Occurrence. Santonian (West well), Albian–Santonian (North well), Albian (East well).

Genus ***Laevidentalina*** Loeblich & Tappan, 1986

Type species. *Laevidentalina aphelis* Loeblich & Tappan, 1986. Cretaceous to Holocene; cosmopolitan.

Laevidentalina spp.

Occurrence. Hauterivian–Coniacian (West well).

Genus ***Nodosaria*** Lamarck, 1816

Type species. *Nautilus radicula* Linnaeus, 1758. Lower Jurassic to Holocene; cosmopolitan.

Nodosaria spp.

Occurrence. Santonian–Campanian (West well), Hauterivian–Campanian (North well).

Genus ***Pseudonodosaria*** Boomgaart, 1949

Type species. *Dentalina brevis* d'Orbigny, 1846. Cretaceous to Holocene; cosmopolitan.

Pseudonodosaria cylindracea (Reuss, 1845)

1845 *Nodosaria* (*Glandulina*) *cylindracea* – Reuss, p. 25, pl. 13, figs. 1–2.
1946 *Pseudoglandulina cylindracea* (Reuss) – Cushman, p. 76, pl. 27, figs. 33–34.

Occurrence. Coniacian–Santonian (North well).

Pseudonodosaria humilis (Roemer, 1841)

1841 *Nodosaria humilis* – Roemer, p. 95, pl. 15, fig. 6.
1975 *Pseudonodosaria* gr. *humilis* Roemer – Malumián & Masiuk, p. 590, pl. 1, fig. 7.

Occurrence. Albian (East well).

Pseudonodosaria spp.

Occurrence. Coniacian (West well).

Subfamily FRONDICULARIINAE Reuss, 1860

Genus ***Frondicularia*** Defrance *in* d'Orbigny, 1826

Type species. *Renulina complanata* Defrance *in* Blainville, 1824. Middle Jurassic to Holocene; cosmopolitan.

Frondicularia undulosa Cushman, 1936a

1936a *Frondicularia undulosa* – Cushman, p. 13, pl. 3, figs. 7–11
1946 *Frondicularia undulosa* Cushman – Cushman, p. 87, pl. 34, figs. 9–13.

Occurrence. Albian (North well).

Genus ***Tribrachia*** Schubert, 1912

Type species. *Tribrachia inelegans* Loeblich & Tappan, 1950. Middle Jurassic to Upper Cretaceous; cosmopolitan.

Tribrachia australiana Ludbrook, 1966

1966 *Tribrachia australiana* – Ludbrook, p. 128, pl. 8, figs. 19–20.
1974 *Tribrachia australiana* Ludbrook – Scheibnerová, p. 712, pl. 2, fig. 16; pl. 10, fig. 6.
1983 *Tribrachia australiana* Ludbrook – Basov & Krasheninnikov, p. 762, pl. 2, fig. 1.

Occurrence. Albian (East well).

Genus ***Tristix*** Macfadyen, 1941

Type species. *Rhabdogonium liasinum* Berthelin, 1879. Lower Jurassic to Eocene; cosmopolitan.

Tristix acutangula (Reuss, 1863)

1863 *Rhabdogonium acutangulum* – Reuss, p. 55, pl. 4, fig. 14.
1995 *Tristix acutangula* (Reuss) – Holbourn & Kaminski, p. 213, pl. 6, fig. 2a–b.

Occurrence. Albian (East well).

Tristix spp.

Occurrence. Albian (North well).

Order VAGINULINIDA Mikhalevich, 1993
Family VAGINULINIDAE Reuss, 1860
Subfamily LENTICULININAE Chapman, Parr, & Collins, 1934

Genus ***Lenticulina*** Lamarck, 1804

Type species. *Lenticulites rotulata* Lamarck, 1804. Triassic to Holocene; cosmopolitan.

Lenticulina cf. ***discrepans*** (Reuss, 1863)

cf. 1863 *Cristellaria* (*Robulina*) *discrepans* – Reuss, p. 78, pl. 9, fig. 7.
cf. 1946 *Robulus discrepans* (Reuss) – Cushman, p. 54, pl. 17, fig. 15.
cf. 1994. *Lenticulina discrepans* (Reuss) – Bolli *et al.,* p. 107, figs. 28.11, 13–15.

Remarks. The few recorded specimens show many similarities with *Lenticulina discrepans* (Reuss, 1863) but are smaller and poorly preserved.

Occurrence. Campanian (West well).

Lenticulina gaultina (Berthelin, 1880)
Figure 2.4

1880 *Cristellaria gaultina* – Berthelin, p. 49, pl. 3, figs. 15–19.
1990 *Lenticulina gaultina* (Berthelin) – Malumián, p. 452, pl. 2, fig. 10.

Occurrence. Albian (North and East wells).

Lenticulina modesta (Bandy, 1951)

1951 *Robulus modestus* – Bandy, p. 493, pl. 72, fig. 9.
1968 *Lenticulina modesta* (Bandy) – Sliter, p. 66, pl. 7, fig. 5.

Occurrence. Coniacian–Santonian (North well).

Lenticulina muensteri (Roemer, 1839)
Figure 2.5

1839 *Robulus münsteri* – Roemer, p. 48, pl. 20, fig. 29a–b.
1946 *Robulus münsteri* (Roemer) – Cushman, p. 53, pl. 17, figs. 3–9.
1968 *Lenticulina muensteri* (Roemer) – Sliter, p. 66, pl. 7, figs. 9, 13.
1990 *Lenticulina muensteri* (Roemer) – Malumián, p. 452, pl. 2, figs. 14–15.

Occurrence. Coniacian–Campanian (West well), Albian–Campanian (North well).

Lenticulina navarroensis (Plummer, 1927)

1927 *Cristellaria navarroensis* – Plummer, p. 39, text. fig. 4.
1946 *Robulus navarroensis* (Plummer) – Cushman, p. 51, pl. 16, figs. 6–8.
1980 *Lenticulina navarroensis* (Plummer) – Bertels, p. 62, pl. 2, fig. 1a–b.

Occurrence. Santonian–Campanian (West well).

Lenticulina nodosa (Reuss, 1863)
Figure 2.6

1863 *Robulina nodosa* – Reuss, p. 78, pl. 9, fig. 6.
1975 *Lenticulina nodosa* (Reuss) – Malumián & Masiuk, p. 588, pl. 2, fig. 7.
1983 *Lenticulina nodosa* (Reuss) – Malumián & Náñez, p. 382, pl. 2, fig. 6.

Remarks. This species, together with the morphologically similar *Astacolus gibber* Espitalié & Sigal, 1963, is indicative of the Valanginian–Hauterivian.

Occurrence. Valanginian–Hauterivian (West, North, and East wells).

Lenticulina praegaultina Bartenstein *et al.,* 1957

1957 *Lenticulina* (*Lenticulina*) *praegaultina* – Bartenstein *et al.*, p. 24, pl. 3, fig. 48.
1975 *Lenticulina praegaultina* Bartenstein *et al.* – Malumián & Masiuk, p. 587, pl. 1, fig. 6a–b.

Occurrence. Valanginian–Hauterivian (West well), Valanginian (North well).

Lenticulina pseudosecans (Cushman, 1938a)

1938a *Robulus pseudo-secans* – Cushman, p. 32, pl. 5, fig. 3.
1946 *Robulus pseudo-secans* Cushman – Cushman, p. 53, pl. 17, figs. 11–13.
1992 *Lenticulina pseudosecans* (Cushman) – Olsson & Usmani, p. 309, fig. 5.12.

Occurrence. Campanian (West well).

Lenticulina secans (Reuss, 1860)

1860 *Cristellaria secans* – Reuss, p. 214, pl. 9, fig. 7.
1990 *Lenticulina secans* (Reuss) – Malumián, p. 452, pl. 2, fig. 8.

Occurrence. Albian (East well).

Lenticulina spissocostata (Cushman, 1938a)

Figure 2.7

1938a *Robulus spisso-costatus* – Cushman, p. 32, pl. 5, fig. 2.
1946 *Robulus spisso-costatus* Cushman – Cushman, p. 52, pl. 16, figs. 11–14; pl. 17, fig. 1.
1965 *Lenticulina spissocostata* (Cushman) – Perlmutter & Todd, p. 11, pl. 1, fig. 13; pl. 6, figs. 3–4.

Occurrence. Albian–Campanian (North well).

Lenticulina stephensoni (Cushman, 1939)

1939 *Robulus stephensoni* – Cushman, p. 90, pl. 16, figs. 2–3.
1946 *Robulus stephensoni* Cushman – Cushman, p. 55, pl. 18, figs. 12–13.

Occurrence. Campanian (North well).

Lenticulina sternalis (Berthelin, 1880)

1880 *Cristellaria sternalis* – Berthelin, p. 51, pl. 3, fig. 2.
1946 *Robulus sternalis* (Berthelin) – Cushman, p. 54, pl. 18, fig. 1.
1954 *Lenticulina sternalis* (Berthelin) – Bartenstein, p. 45.

Occurrence. Albian (East well).

Lenticulina spp.

Occurrence. Albian–Coniacian (West well), Valanginian–Campanian (North well), Valanginian–Cenomanian (East well).

Genus ***Marginulinopsis*** Silvestri, 1904

Type species. *Cristellaria bradyi* Goës, 1894. Jurassic to Holocene; cosmopolitan.

Marginulinopsis tilchae Ludbrook, 1966

1966 *Marginulinopsis tilchae* – Ludbrook, p. 122, pl. 9, fig. 24.
1990 *Marginulina* ex gr. *M. tilchae* (Ludbrook) – Malumián, p. 452, pl. 9, figs. 2–3.

Occurrence. Albian–Coniacian (North well).

Marginulinopsis spp.

Occurrence. Santonian–Campanian (West well), Coniacian–Campanian (North well).

Genus ***Saracenaria*** Defrance, 1824

Type species. *Saracenaria italica* Defrance, 1824. Upper Jurassic to Holocene; cosmopolitan.

Saracenaria triangularis (d'Orbigny, 1840)

Figure 2.8

1840 *Cristellaria triangularis* – d'Orbigny, p. 27, pl. 2, figs. 21–22.
1946 *Saracenaria triangularis* (d'Orbigny) – Cushman, p. 58, pl. 28, figs. 1–3.
1968 *Saracenaria triangularis* (d'Orbigny) – Sliter, p. 74, pl. 9, figs. 3–4.
1976b *Saracenaria triangularis* (d'Orbigny) – Malumián & Masiuk, p. 191, pl. 3, fig. 5.

Occurrence. Valanginian–Campanian (North well), Albian–Campanian (East well).

Saracenaria spp.

Occurrence. Valanginian–Santonian (West well), Albian–Santonian (North well), Coniacian–Santonian (East well).

Subfamily MARGINULININAE Wedekind, 1937

Genus ***Astacolus*** Montfort, 1808

Type species. *Nautilus crepidula* Fichtel & Moll, 1798. Lower Jurassic to Holocene; cosmopolitan.

Astacolus ambanjabensis (Espitalié & Sigal, 1963)

1963 *Lenticulina ambanjabensis* – Espitalié & Sigal, p. 35, pl. 12, figs. 3, 5, 6.
2006 *Astacolus ambanjabensis* (Espitalié & Sigal) – Ballent *et al.*, p. 56, pl. 2, fig. U.

Remarks. This species was originally described as *Lenticulina ambanjabensis* Espitalié & Sigal, 1963, and is still widely accepted (see Hayward *et al.*, 2018), but due to its elongate test with several uncoiled chambers, it is here listed under the genus *Astacolus* (see also Ballent *et al.*, 2006).

Occurrence. Valanginian–Hauterivian (West well), Valanginian (North well).

Astacolus gibber Espitalié & Sigal, 1963
Figure 2.9

1963 *Astacolus gibber* – Espitalié & Sigal, p. 36, pl. 13, figs. 8–11.
1975 *Astacolus gibber* Espitalié & Sigal – Malumián & Masiuk, p. 585, pl. 1, figs. 3, 4a–b.
1983 *Astacolus gibber gibber* Espitalié & Sigal – Malumián & Náñez, p. 382, pl. 2, figs. 7–8.

Remarks. This species, together with the morphologically similar *Lenticulina nodosa* (Reuss, 1863), is indicative of the Valanginian–Hauterivian.

Occurrence. Valanginian–Hauterivian (West, North, and East wells).

Astacolus mutilatus Espitalié & Sigal, 1963

1963 *Astacolus mutilatus* – Espitalié & Sigal, p. 36, pl. 13, figs. 4–7.
1975 *Astacolus mutilatus* Espitalié & Sigal – Malumián & Masiuk, p. 585, pl. 2, fig. 12.

Occurrence. Valanginian (North well).

Astacolus taylorensis Plummer, 1931

1931 *Astacolus taylorensis* – Plummer, p. 143, pl. 11, fig. 16.
1946 *Robulus taylorensis* (Plummer) – Cushman, p. 53, pl. 18, fig. 20.
1968 *Lenticulina taylorensis* (Plummer) – Sliter, p. 68, pl. 7, figs. 14–15.

Occurrence. Coniacian–Campanian (North well).

Astacolus spp.

Occurrence. Campanian (West well), Valanginian–Campanian (North well).

Genus ***Hemirobulina*** Stache, 1864

Type species. *Cristellaria* (*Hemirobulina*) *arcuatula* Stache, 1864. Cretaceous to Holocene; cosmopolitan.

Hemirobulina cephalotes (Reuss, 1863)

1863 *Cristellaria (Cristellaria) cephalotes* – Reuss, p. 67, pl. 7, figs. 5–6.
1994 *Hemirobulina cephalotes* (Reuss) – Meyn & Vespermann, p. 193, pl. 44, figs. 11–18.

Occurrence. Albian (North and East wells).

Genus ***Marginulina*** d'Orbigny, 1826

Type species. *Marginulina raphanus* d'Orbigny, 1826. Lower Jurassic to Holocene; cosmopolitan.

Marginulina aff. ***pseudomarcki*** Cushman, 1937

aff. 1937 *Marginulina pseudomarcki* – Cushman, p. 94, pl. 13, figs. 19–20.
aff. 1946 *Marginulina pseudomarcki* Cushman – Cushman, p. 60, pl. 20, figs. 27–28.

Remarks. Only a few broken specimens were recorded that show certain morphological affinities with *Marginulina pseudomarcki* Cushman, 1937.

Occurrence. Campanian (North well).

Marginulina spp.

Occurrence. Albian–Maastrichtian (North well).

Subfamily VAGINULININAE Reuss, 1860

Genus ***Citharina*** d'Orbigny, 1839

Type species. *Vaginulina* (*Citharina*) *strigillata* Reuss, 1846. Lower Jurassic to Holocene; cosmopolitan.

Citharina sp.

Occurrence. Valanginian (North well).

Genus ***Planularia*** Defrance, 1826

Type species. *Peneroplis auris* Defrance *in* Blainville, 1824. Jurassic to Holocene; cosmopolitan.

Planularia madagascariensis Espitalié & Sigal, 1963

1963 *Planularia madagascariensis* – Espitalié & Sigal, p. 28, pl. 6, figs. 8–11.
1975 *Planularia* ex gr. *P. madagascariensis* Espitalié & Sigal – Malumián & Masiuk, p. 592, pl. 1, figs. 9–10.

Occurrence. Hauterivian (West well).

Genus ***Vaginulina*** d'Orbigny, 1826

Type species. *Nautilus legumen* Linnaeus, 1758. Lower Jurassic to Holocene; cosmopolitan.

Vaginulina spp.

Occurrence. Campanian (North well).

Order POLYMORPHINIDA Mikhalevich, 1980
Suborder POLYMORPHININA Mikhalevich, 1980
Superfamily POLYMORPHINOIDEA d'Orbigny, 1839
Family POLYMORPHINIDAE d'Orbigny, 1839
Subfamily POLYMORPHININAE d'Orbigny, 1839

Genus ***Globulina*** d'Orbigny, 1839

Type species. *Polymorphina* (*Globuline*) *gibba* d'Orbigny, 1826. Middle Jurassic to Holocene; cosmopolitan.

Globulina prisca Reuss, 1863

1863 *Polymorphina* (*Globulina*) *prisca* – Reuss, p. 79, pl. 9, fig. 8a–b.
1946 *Globulina prisca* Reuss – Cushman, p. 97, pl. 40, figs. 15–17.

Occurrence. Albian (East well).

Globulina spp.

Occurrence. Santonian (West well), Campanian (North well).

Genus ***Guttulina*** d'Orbigny, 1839

Type species. *Polymorphina* (*Guttuline*) *communis* d'Orbigny, 1826. Middle Jurassic to Holocene; cosmopolitan.

Guttulina spp.

Occurrence. Hauterivian (West well).

Genus ***Paleopolymorphina*** d'Orbigny, 1826

Type species. *Polymorphina pleurostomelloides* Franke, 1928. Upper Jurassic to Upper Cretaceous; cosmopolitan.

Paleopolymorphina cf. ***inflata*** Espitalié & Sigal, 1963

cf. 1963 *Palaeopolymorphina inflata* – Espitalié & Sigal, p. 64, pl. 30, fig. 18a–b.
not 1975 *Globulina inflata* (Espitalié & Sigal) – Malumián & Masiuk, p. 593, pl. 2, fig. 3.

Remarks. Tentative classification. The original classification as *Palaeopolymorphina inflata* Espitalié & Sigal, 1963, was assigned due to the biserial chambers and the tubular aperture present in the studied specimens. However, it is rather short with highly overlapping chambers in which it differs from the type species. Malumián & Masiuk (1975) assigned it to the genus *Globulina*, but the before mentioned characteristics do not match this genus. Furthermore, the species *Globulina inflata* Reuss, 1851 already exists. Due to the poor preservation of our specimens, we leave its taxonomy open but in reference to the original description.

Occurrence. Valanginian (West well), Valanginian–Hauterivian (North well).

Genus ***Polymorphina*** d'Orbigny, 1826

Type species. *Polymorphina* (*Polymorphine*) *burdigalensis* d'Orbigny, 1826. Cretaceous to Holocene; cosmopolitan.

Polymorphina martinezi Cañón & Ernst *in* Natland *et al.*, 1974

Figure 2.10

1974 *Polymorphina martinezi* – Cañón & Ernst *in* Natland *et al.*, p. 75, pl. 2, fig. 8a–b.

1975 *Pseudopolymorphina martinezi* (Cañón & Ernst) – Malumián & Masiuk, p. 594, pl. 1, fig. 2a–c; pl. 2, fig. 1.

Remarks. Malumián & Masiuk (1975) placed *Polymorphina martinezi* Cañón & Ernst *in* Natland *et al.*, 1974, in the genus *Pseudopolymorphina* because of the regular biserial character of their megalospheric form. However, given the twisted biserial chamber arrangement, mentioned by Cañón & Ernst *in* Natland *et al.* (1974), as well as the strongly overlapping chambers that our specimens exhibit, this species must be placed under the genus *Polymorphina*. Furthermore, Malumián & Masiuk (1975) figured specimens that are clearly carinate, which is not mentioned in the original description. We cannot confirm the presence of carinas in our specimens, so we conclude that these are probably two different species.

Occurrence. Valanginian–Hauterivian (West, North, and East wells).

Subfamily RAMULININAE Brady, 1884

Genus ***Ramulina*** Jones *in* Wright, 1875

Type species. *Ramulina laevis* Jones *in* Wright, 1875. Jurassic to Holocene; cosmopolitan.

Ramulina sp. B

Figure 2.11

1976b *Ramulina* sp. B – Malumián & Masiuk, p. 192, pl. 4, fig. 2.

Occurrence. Santonian–Campanian (East well).

Ramulina spp.

Occurrence. Albian–Campanian (North well), Albian (East well).

Class GLOBOTHALAMEA Pawlowski, Holzman, & Tyszka, 2013

Order ROBERTINIDA Loeblich & Tappan, 1984

Suborder ROBERTININA Loeblich & Tappan, 1984

Superfamily CERATOBULIMINOIDEA Cushman, 1927

Family EPISTOMINIDAE Wedekind, 1937

Subfamily EPISTOMININAE Wedekind, 1937

Genus ***Epistomina*** Terquem, 1883

Type species. *Epistomina regularis* Terquem, 1883. Lower Jurassic to Lower Cretaceous; cosmopolitan.

Epistomina caracolla (Roemer, 1841)

Figure 2.12

1841 *Gyroidina caracolla* – Roemer, p. 97, pl. 15, fig. 22a–c.
1963 *Epistomina (Hoeglundina) caracolla* (Roemer) – Espitalié & Sigal, p. 68, pl. 32, fig. 6.
1983 *Epistomina caracolla caracolla* (Roemer) – Malumián & Náñez, p. 387, pl. 3, figs. 1–5.

Occurrence. Hauterivian (West well).

Epistomina spp.

Occurrence. Hauterivian (West well), Valanginian–Hauterivian (North well).

Subclass TEXTULARIANA Mikhalevich, 1980

Order LITUOLIDA Lankester, 1885

Suborder LITUOLINA Lankester, 1885

Superfamily LITUOLOIDEA Blainville, 1827

Family HAPLOPHRAGMOIDIDAE Maync, 1952

Genus ***Haplophragmoides*** Cushman, 1910

Type species. *Nonionina canariensis* d'Orbigny, 1839. Cretaceous to Holocene; cosmopolitan.

Haplophragmoides spp.

Occurrence. Aptian–Campanian (West well), Albian–Santonian (North well), Maastrichtian (East well).

Family LITUOLIDAE Blainville, 1827

Subfamily AMMOMARGINULININAE Podobina, 1978

Genus ***Ammobaculites*** Cushman, 1910

Type species. *Spirolina agglutinans* d'Orbigny, 1846. Lower Mississippian to Holocene; cosmopolitan.

Ammobaculites spp.

Occurrence. Coniacian–Campanian (West well), Albian–Santonian (North well).

Superfamily RECURVOIDOIDEA Alekseychik-Mitskevich, 1973
Family AMMOSPHAEROIDINIDAE Cushman, 1927
Subfamily RECURVOIDINAE Alekseychik-Mitskevich, 1973

Genus ***Recurvoides*** Cushman, 1910

Type species. *Recurvoides contortus* Earland, 1934. Cretaceous to Holocene; cosmopolitan.

Recurvoides spp.

Occurrence. Aptian–Campanian (North well), Maastrichtian (East well).

Suborder SPIROPLECTAMMININA Mikhalevich, 1992
Superfamily SPIROPLECTAMMINOIDEA Cushman, 1927
Family SPIROPLECTAMMINIDAE Cushman, 1927
Subfamily SPIROPLECTAMMININAE Cushman, 1927

Genus ***Spiroplectammina*** Cushman, 1927

Type species. *Textularia agglutinans* var. *biformis* Parker & Jones, 1865. Carboniferous to Holocene; cosmopolitan.

Spiroplectammina roemeri Lalicker, 1935

1935 *Spiroplectammina roemeri* – Lalicker, p. 9, pl. 2, figs. 5a–c.
1946 *Spiroplectammina laevis* (Roemer) var. *cretosa* Cushman – Cushman, p.27, pl. 6, figs. 1–3.
1990 *Spiroplectammina laevis* (Roemer) – Malumián & Náñez, p. 520, pl. 3, fig. 7

Remarks. This species is accepted as *Spiroplectammina roemeri* Lalicker, 1935 due to *Spiroplectammina laevis* (Roemer, 1841) being *nomen novum* of *Textularia laevis* Ehrenberg, 1840 (see Hayward *et al.*, 2018).

Occurrence. Santonian–Campanian (East well).

Spiroplectammina spectabilis (Grzybowski, 1898), *emend.* Kaminski, 1984

1898 *Spiroplecta spectabilis* – Grzybowski, p. 293, pl. 12, fig. 12.
1974 *Spiroplectammina grzybowskii* Frizzell – Cañón & Ernst *in* Natland & González, p. 69, pl. 1, figs. 8a–b.
1984 *Spiroplectammina spectabilis* (Grzybowski) – Kaminski, p. 31, pl. 12, figs. 1–9; pl. 13, figs. 1–8.

Occurrence. Campanian (North well).

Spiroplectammina spp.

Occurrence. Santonian (West well), Maastrichtian (East well).

Suborder TROCHAMMININA Saidova, 1981
Superfamily TROCHAMMINOIDEA Schwager, 1877
Family TROCHAMMINIDAE Schwager, 1877
Subfamily TROCHAMMININAE Schwager, 1877

Genus ***Trochammina*** Parker & Jones, 1859

Type species. *Nautilus inflatus* Montagu, 1808. Carboniferous to Holocene; cosmopolitan.

Trochammina spp.

Occurrence. Coniacian–Campanian (West well), Albian–Campanian (North well), Maastrichtian (East well).

Suborder VERNEUILININA Kaminski & Mikhalevich *in* Kaminski, 2004
Superfamily VERNEUILINOIDEA Cushman, 1911
Family VERNEUILINIDAE Cushman, 1911
Subfamily VERNEUILININAE Cushman, 1911

Genus ***Gaudryina*** d'Orbigny, 1840

Type species. *Gaudryina rugosa* d'Orbigny, 1840. Upper Triassic to Holocene; cosmopolitan.

Gaudryina juliana Malumián & Masiuk, 1976b

1976b *Gaudryina juliana* – Malumián & Masiuk, p. 186, pl. 2, fig. 7.

Occurrence. Albian–Santonian (North well).

Gaudryina laevigata Franke, 1914

1914 *Gaudryina laevigata* – Franke, p. 431, pl. 27, figs. 1–2.
1946 *Gaudryina laevigata* Franke – Cushman, p. 33, pl. 8, fig. 4.
1960 *Gaudryina laevigata* Franke – Belford, p. 12, pl. 2, figs. 15–16.

1968 *Gaudryina laevigata* Franke – Sliter, p. 48, pl. 3, fig. 8.
1976b *Gaudryina* cf. *G. laevigata* Franke – Malumián & Masiuk, p. 186, pl. 2, fig. 4.

Occurrence. Coniacian–Campanian (West well).

Gaudryina pyramidata Cushman, 1926a

Figure 2.13

1926a *Gaudryina laevigata* Franke var. *pyramidata* – Cushman, p. 587, pl. 16, fig. 8.
1946 *Gaudryina (Pseudogaudryina) pyramidata* Cushman – Cushman, p. 36, pl. 8, fig. 14.
1968 *Gaudryina pyramidata* Cushman – Sliter, p. 48, pl. 3, fig. 9.
1990 *Gaudryina pyramidata* Cushman – Malumián & Náñez, p. 516, pl. 1, figs. 13–14.

Occurrence. Coniacian–Campanian (West well), Santonian–Campanian (North and East wells).

Gaudryina rugosa d'Orbigny, 1840

1840 *Gaudryina rugosa* – d'Orbigny, p. 44, pl. 4, figs. 20–21.
1960 *Gaudryina rugosa* d'Orbigny – Belford, p. 13, pl. 2, figs. 17–20.
1987 *Gaudryina rugosa* d'Orbigny – Loeblich & Tappan, p. 136, pl. 144, figs. 1–3.

Occurrence. Albian–Coniacian (North well).

Family REOPHACELLIDAE Mikhalevich & Kaminski, 2000

Subfamily REOPHACELLINAE Mikhalevich & Kaminski, 2000

Genus ***Uvigerinammina*** Majzon, 1943

Type species. *Uvigerinammina jankoi* Majzon, 1943. Lower Cretaceous to Paleocene; cosmopolitan.

Uvigerinammina jankoi Majzon, 1943

1943 *Uvigerinammina jankoi* – Majzon, p. 158, pl. 2, fig. 15a–b.
1983 *Uvigerinammina jankoi* Majzon – Basov & Krasheninnikov, p. 760, pl. 1, fig. 8.
1987 *Uvigerinammina jankoi* Majzon – Loeblich & Tappan, p. 134, pl. 141, figs. 13–20.
1990 *Uvigerinammina jankoi* Majzon – Malumián & Náñez, p. 522, pl. 3, figs. 17–19.

Occurrence. Santonian–Campanian (East well).

Subfamily SPIROPLECTINATINAE Cushman, 1928

Genus ***Spiroplectinata*** Cushman, 1927

Type species. *Textularia annectens* Parker & Jones, 1863. Lower Cretaceous; cosmopolitan.

Spiroplectinata annectens (Parker & Jones, 1863)

Figure 2.14

1863 *Textularia annectens* – Parker & Jones, p. 92, text. fig. 1.
1974 *Spiroplectinata annectens* (Parker & Jones) – Cañón & Ernst *in* Natland *et al.*, p. 70, pl. 1, fig. 11a–c.
1976a *Spiroplectinata annectens* (Parker & Jones) – Malumián & Masiuk, p. 396, pl. 1, fig. 6; pl. 4, fig. 1.
1987 *Spiroplectinata annectens* (Parker & Jones) – Loeblich & Tappan, p. 136, pl. 143, figs. 12–13.

Occurrence. Albian (North and East wells).

Family TRITAXIIDAE Plotnikova, 1979

Genus ***Tritaxia*** Reuss, 1860

Type species. *Textularia tricarinata* Reuss, 1844. Cretaceous; cosmopolitan.

Tritaxia gaultina australis Malumián & Masiuk, 1976a

Figure 2.15

1976a *Tritaxia gaultina australis* – Malumián & Masiuk, p. 398, pl. 1, figs. 1–3.

Remarks. Differs from *Tritaxia gaultina gaultina* in the angular instead of rounded uniserial stage (see Malumián & Masiuk, 1976a).

Occurrence. Albian (North and East wells).

Tritaxia gaultina gaultina (Morozova, 1948)

1948 *Clavulina gaultina* – Morozova, p. 36, pl. 1, fig. 4.
1976a *Tritaxia gaultina gaultina* (Morozova) – Malumián & Masiuk, p. 398, pl. 1, fig. 4.

Remarks. This species was originally described as *Clavulina gaultina* Morozova, 1948 (see also Hayward *et al.*, 2018). However, due to the absence of an apertural tooth plate, it must be placed under the genus *Tritaxia*, following the designation by Malumián & Masiuk (1976a).

Occurrence. Albian–Cenomanian (North well), Albian (East well).

Tritaxia pyramidata Reuss, 1863

1863 *Tritaxia pyramidata* – Reuss, p. 32, pl. 1, fig. 9.

Occurrence. Coniacian (West well), Albian–Campanian (North and East wells).

Order TEXTULARIIDA Delage & Hérouard, 1896
Suborder TEXTULARIINA Delage & Hérouard, 1896
Superfamily TEXTULARIOIDEA Ehrenberg, 1838
Family TEXTULARIIDAE Ehrenberg, 1838
Subfamily TEXTULARIINAE Ehrenberg, 1838

Genus ***Textularia*** Defrance, 1824

Type species. *Textularia sagittula* Defrance, 1824. Cretaceous to Holocene; cosmopolitan.

Textularia chapmani Lalicker, 1935

1935 *Textularia chapmani* – Lalicker, p. 13, pl. 2, figs. 8–9.
Occurrence. Albian (East well).

Textularia spp.

Occurrence. Albian–Santonian (North well).

Superfamily EGGERELLOIDEA Cushman, 1937
Family EGGERELLIDAE Cushman, 1937
Subfamily DOROTHIINAE Balakhmatova, 1972

Genus ***Dorothia*** (Plummer, 1931)

Type species. *Gaudryina bulletta* Carsey, 1926. Lower Cretaceous to Paleocene; cosmopolitan.

Dorothia bulletta (Carsey, 1926)

1926 *Gaudryina bulletta* Carsey, p. 28, pl. 4, fig. 4.
1960 *Dorothia bulletta* (Carsey) – Belford, p. 18, pl. 4, figs. 8–10.
1968 *Dorothia bulletta* (Carsey) – Sliter, p. 49, pl. 3, fig. 1.
1976b *Dorothia bulleta* (Carsey) – Malumián & Masiuk, p. 186, pl. 1, fig. 3.
1987 *Dorothia bulleta* (Carsey) – Loeblich & Tappan, p. 169, pl. 187, figs. 8–12.

Occurrence. Campanian (West well).

Dorothia crassa (Marsson, 1878)

1878 *Gaudryina crassa* – Marsson, p. 158, pl. 3, fig. 27a–c.
1981 *Dorothia crassa* (Marsson) – Morgiel & Olszewska, p. 20, pl. 5, fig. 19.

Remarks. This species was originally described as *Gaudryina crassa* Marsson, 1878 (see also Hayward *et al.*, 2018). However, it appears to have an initial trochospiral stage and is almost circular in section, and therefore listed here under the genus *Dorothia* (see also Morgiel & Olszewska, 1981).

Occurrence. Maastrichtian (East well).

Dorothia mordojovichi Cañón & Ernst *in* Natland *et al.*, 1974
Figure 2.16

1974 *Dorothia mordojovichi* – Cañón & Ernst *in* Natland *et al.*, p. 71, pl. 1, fig. 15a–b.
1976a *Dorothia mordojovichi* Cañón & Ernst – Malumián & Masiuk, p. 399, pl. 1, fig. 7a–b.

Occurrence. Albian (North and East wells).

Dorothia retusa (Cushman, 1926a)

1926a *Gaudryina retusa* – Cushman, p. 588, pl. 16, fig. 10.
1946 *Dorothia retusa* (Cushman) – Cushman, p. 46, pl. 13, figs. 1–4.

Occurrence. Campanian (West well).

Genus ***Marssonella*** Cushman, 1933

Type species. *Gaudryina oxycona* Reuss, 1860. Lower Cretaceous to Upper Cretaceous; cosmopolitan.

Marssonella oxycona (Reuss, 1860)
Figure 2.17

1860 *Gaudryina oxycona* – Reuss, p. 229, pl. 12, fig. 3.
1946 *Marssonella oxycona* (Reuss) – Cushman, p. 43, pl. 12, figs. 3–5.
1960 *Marssonella oxycona* (Reuss) – Belford, p. 16, pl. 4, figs. 1–3.
1968 *Gaudryina oxycona* Reuss – Sliter, p. 50, pl. 3, fig. 13.
1987 *Marssonella oxycona* (Reuss) – Loeblich & Tappan, p. 169, pl. 188, figs. 1–3.

Occurrence. Santonian (West well), Albian–Santonian (North well), Albian–Campanian (East well).

Family VALVULINIDAE Berthelin, 1880
Subfamily VALVULININAE Berthelin, 1880

Genus ***Clavulina*** d'Orbigny, 1826

Type species. *Clavulina parisiensis* d'Orbigny, 1826. Cretaceous to Holocene; cosmopolitan.

Clavulina cf. ***gabonica*** Le Calvez *et al.*, 1971

cf. 1971 *Clavulina gabonica* – Le Calvez *et al.*, p. 308, pl. 1, figs. 7, 9.
cf. 1983 *Clavulina gabonica* Le Calvez *et al.* – Basov & Krasheninnikov, p. 761, pl. 1, figs. 1–2.

Remarks. Only a few broken specimens were recorded that showed several similarities with *Clavulina gabonica* Le Calvez *et al.*, 1971.

Occurrence. Albian (East well).

Subclass ROTALIANA Mikhalevich, 1980
Order ROTALIIDA Delage & Hérouard, 1896
Superfamily HETEROHELICOIDEA Cushman, 1927
Family HETEROHELICIDAE Cushman, 1927

Genus ***Planoheterohelix*** Georgescu & Huber, 2009

Type species. *Planoheterohelix postmoremani* Georgescu & Huber, 2009. Upper Cretaceous; cosmopolitan.

Planoheterohelix globulosa (Ehrenberg, 1840)
Figure 2.18

1840 *Textularia globulosa* – Ehrenberg, p. 135, pl. 4, figs. 2, 4, 5, 7, 8.
1983 *Heterohelix globulosa* (Ehrenberg) – Krasheninnikov & Basov, p. 807, pl. 12, figs. 13–15.
2015 *Planoheterohelix globulosa* (Ehrenberg) – Haynes *et al.*, p. 55, fig. 11.1–11.14.

Occurrence. Santonian (West well), Santonian–Campanian (North well), Coniacian–Campanian (East well).

Planoheterohelix moremani (Cushman, 1938b)

1938b *Gümbelina globulosa* – Cushman, p. 10, pl. 2, figs. 1–3.
1978 *Heterohelix moremani* (Cushman) – Malumián & Masiuk, p. 39, pl. 1, fig. 3.
2009 *Planoheterohelix moremani* (Cushman) – Georgescu & Huber, p. 344, pl. 4, figs. 1–13.
2015 *Planoheterohelix moremani* (Cushman) – Haynes *et al.*, p. 52, fig. 9.1–9.5.

Occurrence. Albian (North well).

Planoheterohelix cf. ***olssoni*** (Georgescu, 2000)

cf. 2000 *Heterohelix olssoni* – Georgescu, p. 162, pl. 1, figs. 1–2.

Remarks. Only one specimen was recorded that consists of two pairs of globular chambers, rapidly increasing in size. The test is almost as broad as long, in which it differs from any other heterohelicid species recorded here. A comparison with the original description from Georgescu (2000) revealed many similarities. However, our specimen is highly corroded, and this species has not been recorded from the basin before. Therefore, the classification remains tentative. On both major databases (Hayward *et al.*, 2018; Huber *et al.*, 2020), this species is referred to as *Planoheterohelix olssoni* (Georgescu, 2000). However, there appears to be no publication officially formalizing the change in nomenclature in accordance with the International Code of Zoological Nomenclature (ICZN) code. Nevertheless, we follow the generic position proposed on Huber *et al.*, (2020) because the specimens originally described by Georgescu (2000) as initially planispiral and unornamented, later were described as possessing a large proloculus and fine striae (Georgescu & Huber, 2009), which justifies placing this species under *Planoheterohelix*.

Occurrence. Coniacian (North well).

Planoheterohelix reussi (Cushman, 1938b)
Figure 2.19

1938b *Gümbelina reussi* – Cushman, p. 11, pl. 2, figs. 6–9.
1978 *Heterohelix reussi* (Cushman) – Malumián & Masiuk, p. 37, pl. 1, fig. 1.
1983 *Heterohelix reussi* (Cushman) – Krasheninnikov & Basov, p. 807, pl. 12, figs. 1–3.
2015 *Planoheterohelix reussi* (Cushman) – Haynes *et al.*, p. 57, figs. 18.1–18.9.

Occurrence. Coniacian–Santonian (West and North wells), Coniacian–Campanian (East well).

Planoheterohelix sp.

Occurrence. Albian (East well).

Superfamily PLANOMALINOIDEA Bolli, Loeblich, & Tappan, 1957
Family GLOBIGERINELLOIDIDAE Longoria, 1974
Subfamily GLOBIGERINELLOIDINAE Longoria, 1974

Genus ***Globigerinelloides*** Cushman & Ten Dam, 1948

Type species. *Globigerinelloides algeriana* Cushman & Ten Dam, 1948. Lower Cretaceous to Upper Cretaceous; cosmopolitan.

Globigerinelloides asper (Ehrenberg, 1854)

Figure 2.20

1854 *Phanerostomum asperum* – Ehrenberg, p. 23, pl. 30, fig. 26a–b; pl. 32, fig. 24; pl. 32, fig. 42.
1960 *Globigerinella aspera* (Ehrenberg) – Belford, p. 91, pl. 25, figs. 4–6.
1978 *Globigerinelloides asperus* (Ehrenberg) – Malumián & Masiuk, p. 37, pl. 1, fig. 1.
1983 *Globigerinelloides asperus* (Ehrenberg) – Krasheninnikov & Basov, p. 803, pl. 2, figs. 1–3.

Occurrence. Coniacian–Campanian (West and North wells).

Superfamily ROTALIPOROIDEA Sigal, 1958

Family HEDBERGELLIDAE Loeblich & Tappan, 1961

Subfamily HEDBERGELLINAE Loeblich & Tappan, 1961

Genus ***Costellagerina*** Petters *et al.*, 1983

Type species. *Rugoglobigerina bulbosa* Belford, 1960. Upper Cretaceous; cosmopolitan.

Costellagerina bulbosa (Belford, 1960)

Figure 3.1

1960 *Rugoglobigerina (Rugoglobigerina) bulbosa* – Belford, p. 94, pl. 26, figs. 1–10.
1983 *Costellagerina bulbosa* (Belford) – Petters *et al.*, p. 250, pl. 1, figs. 1–16.

Remarks. This species is abundant in our samples (with exception of the East well) and, together with its sister taxon, indicative of the Coniacian–Campanian.

Occurrence. Coniacian–Campanian (West and North wells).

Costellagerina pilula (Belford, 1960)

Figure 3.2

1960 *Rugoglobigerina (Rugoglobigerina) pilula* – Belford, p. 92, pl. 25, figs. 7–13.
1978 "*Rugoglobigerina*" *pilula* (Belford) – Malumián & Masiuk, p. 44, pl. 2, figs. 2–3.
1983 *Rugoglobigerina pilula* (Belford) – Krasheninnikov & Basov, p. 807, pl. 11, figs. 3–6.
1983 *Costellagerina pilula* (Belford) – Petters *et al.*, p. 248.

Remarks. This species is abundant in our samples and, together with its sister taxon, indicative of the Coniacian–Campanian.

Occurrence. Coniacian–Campanian (West and North wells), Santonian–Campanian (East well).

Genus ***Muricohedbergella*** Huber & Leckie, 2011

Type species. *Globigerina cretacea* var. *delrioensis* Carsey, 1926. Lower Cretaceous to Upper Cretaceous; cosmopolitan.

Muricohedbergella cf. ***angolae*** (Caron, 1978)

cf. 1978 *Hedbergella angolae* – Caron, p. 658, pl. 10, figs. 5–7.
cf. 2011 *Muricohedbergella angolae* (Caron) – Huber & Leckie, p. 84.

Remarks. A few specimens were recorded that exhibit an elongated test and rapidly increasing chambers, in which it differs from morphologically similar species, especially *Muricohedbergella delrioensis* (Carsey, 1926). However, due to the generally poor preservation, the classification remains tentative.

Occurrence. Albian (North well).

Muricohedbergella delrioensis (Carsey, 1926)

Figure 3.3

1926 *Globigerina cretacea* d'Orbigny var. *del rioensis* – Carsey, p. 43.
1978 *Hedbergella delrioensis* (Carsey) – Caron, p. 658, pl. 5, figs. 1–2, pl. 7, figs. 5–6.
1978 *Hedbergella delrioensis* (Carsey) – Malumián & Masiuk, p. 41, pl. 2, fig. 7.
1983 *Hedbergella delrioensis* (Carsey) – Krasheninnikov & Basov, p. 804, pl. 3, figs. 1–4.
2011 *Muricohedbergella delrioensis* (Carsey) – Huber & Leckie, p. 84.

Remarks. This species is abundant in our samples (with exception of the West well) and, together with its sister taxa, indicative of the Albian–Cenomanian.

Occurrence. Albian (North well), Albian–Cenomanian (East well).

Muricohedbergella planispira (Tappan, 1940)

Figure 3.4

1940 *Globigerina planispira* – Tappan, p. 122, pl. 19, fig. 12.

1978 *Hedbergella planispira* (Tappan) – Caron, p. 658, pl. 1, figs. 1–2; pl. 7, figs. 7–8.
1978 *Hedbergella planispira* (Tappan) – Malumián & Masiuk, p. 43, pl. 2, fig. 8.
1983 *Hedbergella planispira* (Tappan) – Krasheninnikov & Basov, p. 804, pl. 4, figs. 1–6.
2011 *Muricohedbergella planispira* (Tappan) – Huber & Leckie, p. 84, fig. 17.6–17.10.

Remarks. This species is abundant in our samples (with exception of the West well) and, together with its sister taxa, indicative of the Albian–Cenomanian.

Occurrence. Albian (North well), Albian–Cenomanian (East well).

Muricohedbergella portsdownensis (Williams-Mitchell, 1948)

Figure 3.5

1948 *Globigerina portsdownensis* – Williams-Mitchell, p. 96, pl. 8, fig. 4.
1978 *Hedbergella portsdownensis* (Williams-Mitchell) – Caron, p. 658, pl. 10, figs. 1–2.
1978 *Hedbergella portsdownensis* (Williams-Mitchell) – Malumián & Masiuk, p. 41, pl. 2, fig. 6.
1983 *Hedbergella portsdownensis* (Williams-Mitchell) – Krasheninnikov & Basov, p. 804, pl. 4, figs. 14–16.
2011 *Muricohedbergella portsdownensis* (Williams-Mitchell) – Huber & Leckie, p. 84.

Remarks. This species is abundant in our samples (with exception of the West well) and, together with its sister taxa, indicative of the Albian–Cenomanian.

Occurrence. Albian (West and North wells), Albian–Cenomanian (East well).

Genus ***Whiteinella*** Pessagno, 1967

Type species. *Whiteinella archaeocretacea* Pessagno, 1967. Upper Cretaceous; cosmopolitan.

Whiteinella baltica Douglas & Rankin, 1969

Figure 3.6

1969 *Whiteinella baltica* Douglas & Rankin, p. 198, text. fig. 9A–I.
1978 *Whiteinella baltica* Douglas & Rankin – Caron, p. 659, pl. 4, figs. 4–5.
1978 *Whiteinella baltica* Douglas & Rankin – Malumián & Masiuk, p. 45, pl. 3, fig. 1a–c.
1983 *Whiteinella baltica* Douglas & Rankin – Krasheninnikov & Basov, p. 805, pl. 7, figs. 4–9.

Occurrence. Coniacian–Campanian (West and North wells), Santonian–Campanian (East well).

Subfamily ROTUNDININAE Bellier & Salaj, 1977

Genus ***Praeglobotruncana*** Bermúdez, 1952

Type species. *Globorotalia delrioensis* Plummer, 1931. Lower Cretaceous to Upper Cretaceous; cosmopolitan.

Praeglobotruncana delrioensis (Plummer, 1931)

1931 *Globorotalia delrioensis* – Plummer, p. 199, pl. 13, fig. 2.
1978 *Praeglobotruncana delrioensis* (Plummer) – Caron, p. 660, pl. 7, figs. 3–4.
1987 *Praeglobotruncana delrioensis* (Plummer) – Loeblich & Tappan, p. 463, pl. 497, figs. 5–16.

Occurrence. Albian (East well).

Superfamily GLOBOTRUNCANOIDEA Brotzen, 1942

Family GLOBOTRUNCANIDAE Brotzen, 1942

Subfamily GLOBOTRUNCANINAE Brotzen, 1942

Genus ***Globotruncana*** Cushman, 1927

Type species. *Pulvinulina arca* Cushman, 1926b. Upper Cretaceous; cosmopolitan.

Globotruncana lapparenti Brotzen, 1936, *emend*. Pessagno, 1967

Figure 3.7

1936 *Globotruncana lapparenti* – Brotzen, p. 175, pl. 1, figs. 1–4, 7; pl. 6, figs. 2–3; pl. 8; pl. 9, fig. 2; text-figs. 1a–h, 2a–n, 3a–b, 5d.
1960 *Globotruncana lapparenti lapparenti* (Brotzen) – Belford, p. 96, pl. 27, figs. 6–12.
1967 *Globotruncana lapparenti* Brotzen – Pessagno, p. 344, pl. 71, figs. 6–13; pl. 97, figs. 8–9.
1983 *Globotruncana pseudolinneiana* Pessagno – Krasheninnikov & Basov, p. 806, pl. 9, figs. 1–3.

Occurrence. Santonian–Campanian (East well).

Globotruncana spp.

Occurrence. Coniacian–Santonian (West well), Coniacian (North well).

Family RUGOGLOBIGERINIDAE Subbotina, 1959

Genus ***Archaeoglobigerina*** Pessagno, 1967

Type species. *Archaeoglobigerina blowi* Pessagno, 1967. Upper Cretaceous; cosmopolitan.

Archaeoglobigerina sp.

Remarks. This taxon is represented by specimens exhibiting a high trochospiral coil, bearing many similarities with *Globigerina wenzeli* Cañon & Ernst *in* Natland *et al.*, 1974, which according to Malumián & Masiuk (1978) may be a junior synonym of *Archaeoglobigerina bosquensis* Pessagno, 1967, but the poor preservation of our specimens does not allow an exact classification.

Occurrence. Coniacian–Campanian (West and North wells).

Superfamily TURRILINOIDEA Cushman, 1927
Family TURRILINIDAE Cushman, 1927

Genus ***Praebulimina*** Hofker, 1953

Type species. *Bulimina ovulum* Reuss, 1844. Middle Jurassic to Upper Cretaceous; cosmopolitan.

Praebulimina reussi (Morrow, 1934)

1934 *Bulimina reussi* – Morrow, p. 195, pl. 29, fig. 12.
1946 *Bulimina reussi* Morrow – Cushman, p. 120, pl. 51, figs. 1–5.
1978 *Praebulimina reussi* (Morrow) – Beckmann, p. 768, pl. 2, fig. 3.

Occurrence. Coniacian–Campanian (West and North wells).

Superfamily BULIMINOIDEA Jones, 1875
Family BULIMINIDAE Jones, 1875

Genus ***Bulimina*** d'Orbigny, 1826

Type species. *Bulimina marginata* d'Orbigny, 1826. Upper Cretaceous to Holocene; cosmopolitan.

Bulimina kickapooensis Cole, 1938

1938 *Bulimina kickapooensis* – Cole, p. 45, pl. 15, figs. 13–14, 16.
1946 *Bulimina kickapooensis* Cole – Cushman, p. 123, pl. 51, figs. 11, 12, 14; pl. 66, fig. 12.
1968 *Praebulimina kickapooensis* (Cole) – Sliter, p. 84, pl. 11, figs. 17–19.

Occurrence. Campanian (West well).

Superfamily PLEUROSTOMELLOIDEA Reuss, 1860
Family PLEUROSTOMELLIDAE Reuss, 1860

Genus ***Pleurostomella*** Reuss, 1860

Type species. *Dentalina subnodosa* Reuss, 1851. Lower Cretaceous to Holocene; cosmopolitan.

Pleurostomella subnodosa Reuss, 1851

not 1851 *Dentalina subnodosa* – Reuss, p. 24, pl. 2, fig. 9.
1860 *Pleurostomella subnodosa* – Reuss, p. 204, pl. 8, fig. 2.
1946 *Pleurostomella subnodosa* Reuss – Cushman, p. 132, pl. 55, figs. 1–9.
1960 *Pleurostomella subnodosa* Reuss – Belford, p. 70, pl. 19, figs. 3–5.
1968 *Pleurostomella subnodosa* Reuss – Sliter, p. 110, pl. 19, fig. 10.
1987 *Pleurostomella subnodosa* Reuss – Loeblich & Tappan, p. 538, pl. 584, figs. 1–10.

Remarks. *Dentalina subnodosa* Reuss, 1851 was assigned as type species of the genus *Pleurostomella* (see Loeblich & Tappan, 1987). However, the original figure and description clearly refer to an entirely uniserial specimen with a simple aperture, which does not match the characteristics of this genus. Confusingly, Reuss (1860) later described another species and called it *Pleurostomella subnodosa*, which shows all the typical characteristics of the genus, and therefore should be considered the correct type species.

Occurrence. Santonian–Campanian (East well).

Pleurostomella spp.

Occurrence. Coniacian–Campanian (North well).

Superfamily DISCORBOIDEA Ehrenberg, 1838
Family CANCRISIDAE Chapman, Parr, & Collins, 1934

Genus ***Gyroidinoides*** Brotzen, 1942

Type species. *Rotalina nitida* Reuss, 1850. Upper Cretaceous to Holocene; cosmopolitan.

Gyroidinoides globosa (Hagenow, 1842)

1842 *Nonionina globosa* – Hagenow, p. 574.
1946 *Gyroidina globosa* (Hagenow) – Cushman, p. 140, pl.

58, figs. 6–8.
1959 *Gyroidinoides globosa* (Hagenow) – Reiss, p. 355.
1960 *Gyroidina globosa* (Hagenow) – Belford, p. 78, pl. 21, figs. 4–9.

Occurrence. Albian–Campanian (North well).

Gyroidinoides cf. ***primitiva*** Hofker, 1957

cf. 1957 *Gyroidinoides primitiva* – Hofker, p. 393, text. fig. 436.
cf. 1983 *Gyroidinoides primitiva* Hofker – Basov & Krasheninnikov, p. 764, pl. 2, figs. 4–6.

Remarks. Only a few broken specimens are recorded that show several similarities with *Gyroidinoides primitiva* Hofker, 1957.

Occurrence. Albian (East well).

Gyroidinoides spp.

Occurrence. Albian–Maastrichtian (East well).

Genus ***Stensioeina*** Brotzen, 1936

Type species. *Rotalia exsculpta* Reuss, 1860. Upper Cretaceous; cosmopolitan.

Stensioeina infrafosa (Finlay, 1940)

1940 *Gyroidina infrafosa* – Finlay, p. 462, pl. 66, figs. 181–183.
1974 *Gyroidina infrafosa* Finlay – Cañón & Ernst *in* Natland *et al.*, p. 87, pl. 5, fig. 3a–c.
1976b *Stensioeina* cf. *infrafossa* (Finlay) – Malumián & Masiuk, p. 199, pl. 4, fig. 6.

Remarks. Although originally described as *Gyroidina infrafosa* Finlay, 1940 (see also Hayward *et al.*, 2018), this species is here listed under the genus *Stensioeina* due to its irregularly ornamented surface, following the designation by Malumián & Masiuk (1976b).

Occurrence. Coniacian (West well), Coniacian–Campanian (North wells).

Genus ***Valvulineria*** Cushman, 1926c

Type species. *Valvulineria californica* Cushman, 1926c. Cretaceous to Holocene; cosmopolitan.

Valvulineria fueguina Malumián & Masiuk, 1976a

1976a *Valvulineria fueguina* – Malumián & Masiuk, p. 400, pl. 3, fig. 1a–d; pl. 4., fig. 2a–b.

Occurrence. Albian (East well).

Valvulineria cf. ***lenticula*** (Reuss, 1845)

Figure 3.8

cf. 1845 *Rotalina lenticula* – Reuss, p. 35, pl. 12, fig. 17.
cf. 1960 *Valvulineria lenticula* (Reuss) – Belford, p. 75, pl. 20, figs. 3–10.
1976b *Valvulineria* cf. *lenticula* (Reuss) – Malumián & Masiuk, p. 192, pl. 4, fig. 7.
cf. 1987 *Valvalabamina lenticula* (Reuss) – Loeblich & Tappan, 628, pl. 706, figs. 4–12.
cf. 1996 *Gyroidinoides lenticulus* (Reuss) – Revets, p. 78, pl. 11, figs. 9–12

Remarks. The classification here follows the description by Malumián & Masiuk (1976b), who related their specimens to *Valvulineria lenticula* (Reuss, 1845), pictured by Belford (1960), but kept an open taxonomy due to the lower number of chambers in the final whorl. This species was later chosen as type species of *Valvalabamina* (see Loeblich & Tappan, 1987), but was ultimately accepted as *Gyroidinoides lenticulus*, because Revets (1996) synomymized *Valvalabamina* with *Gyroidinoides* (see also Hayward *et al.*, 2018). However, he also pointed out the substantial similarities with *Valvulineria*. Therefore, and due to the lack of an angular umbilical shoulder and the larger umbilical flap, we list it under the genus *Valvulineria*.

Occurrence. Coniacian–Santonian (West well).

Valvulineria spp.

Occurrence. Albian–Santonian (North well).

Family CONORBIDAE Reiss, 1963

Genus ***Notoconorbina*** Malumián & Masiuk, 1976a

Type species. *Notoconorbina leanzai* Malumián & Masiuk, 1976a. Lower Cretaceous; Argentina.

Notoconorbina leanzai Malumián & Masiuk, 1976a

1976a *Notoconorbina leanzai* – Malumián & Masiuk, p. 401, pl. 3, fig. 3a–c; pl. 4., figs. 5a–b.

1987 *Notoconorbina leanzai* Malumián & Masiuk – Loeblich & Tappan, p. 542, pl. 588, figs. 1–5.

Occurrence. Albian (East well).

Superfamily CHILOSTOMELLOIDEA Brady, 1881

Family CHILOSTOMELLIDAE Brady, 1881

Subfamily PALLAIMORPHININAE Loeblich & Tappan, 1987

Genus ***Globimorphina*** Voloshina, 1969

Type species. *Globigerina trochoides* Reuss, 1845. Upper Cretaceous to Eocene; cosmopolitan.

Globimorphina trochoides (Reuss, 1845)

1845 *Globigerina trochoides* – Reuss, p. 36, pl. 12, fig. 22.
1946 *Allomorphina trochoides* (Reuss) – Cushman, p. 145, pl. 60, fig. 7.
1987 *Globimorphina trochoides* (Reuss) – Loeblich & Tappan, p. 626, pl. 703, figs. 7–10.

Occurrence. Campanian (North well).

Family QUADRIMORPHINIDAE Saidova, 1981

Genus ***Quadrimorphina*** Finlay, 1939

Type species. *Valvulina allomorphinoides* Reuss, 1860. Upper Cretaceous to Holocene; cosmopolitan.

Quadrimorphina allomorphinoides (Reuss, 1860)

1860 *Valvulina allomorphinoides* – Reuss, p. 223, pl. 11, fig. 6.
1946 *Valvulineria allomorphinoides* (Reuss) – Cushman, p. 138, pl. 57, figs. 6–7.
1960 *Quadrimorphina allomorphinoides* (Reuss) – Belford, p. 87, pl. 24, figs. 9–12.
1968 *Quadrimorphina allomorphinoides* (Reuss) – Sliter, p. 114, pl. 20, fig. 7.
1976b *Quadrimorphina allomorphinoides* (Reuss) – Malumián & Masiuk, p. 194, pl. 1, fig. 10.
1987 *Quadrimorphina allomorphinoides* (Reuss) – Loeblich & Tappan, p. 627, pl. 705, figs. 6–9.

Occurrence. Campanian (West well).

Family ALABAMINIDAE Hofker, 1951

Genus ***Alabamina*** Toulmin, 1941

Type species. *Alabamina wilcoxensis* Toulmin, 1941. Upper Cretaceous to Holocene; cosmopolitan.

Alabamina australis Belford, 1960

Figure 3.9

1960 *Alabamina australis australis* – Belford, p. 84, pl. 23, figs. 13–20.
1976b *Alabamina australis australis* Belford – Malumián & Masiuk, p. 194, pl. 5, fig. 2.

Remarks. This species has been simply accepted as *Alabamina australis* Belford, 1960 (see Hayward *et al.*, 2018).

Occurrence. Coniacian–Campanian (West and North wells), Santonian–Maastrichtian (East well).

Genus ***Osangularia*** Brotzen, 1940

Type species. *Osangularia lens* Brotzen, 1940. Lower Cretaceous to Holocene; cosmopolitan.

Osangularia utaturensis (Sastry & Sastri, 1966)

Figure 3.10

1966 *Eponides utaturensis* – Sastry & Sastri, p. 292, pl. 19, fig. 6a–c.
1974 *Osangularia utaturensis* (Sastry & Sastri) – Scheibnerová, p. 714, pl. 4, figs. 27–28; pl. 5, figs. 1–9; pl. 11, figs. 4a–c, 5a–c.
1983 *Osangularia utaturensis* (Sastry & Sastri) – Basov & Krasheninnikov, p. 764, p. 3, figs. 1–2.

Remarks. The classification here follows the description by Scheibnerová (1974), who concluded that *Eponides utaturensis* Sastry & Sastri, 1966 (see also Hayward *et al.*, 2018), due to its V-shaped aperture which was not discussed by the original authors, must be placed under the genus *Osangularia* (see also Basov & Krasheninnikov, 1983).

Occurrence. Albian (North and East wells).

Family GLOBOROTALITIDAE Loeblich & Tappan, 1984

Genus ***Globorotalites*** Brotzen, 1942

Type species. *Globorotalia multisepta* Brotzen, 1936. Lower Cretaceous to Upper Cretaceous; cosmopolitan.

Globorotalites sp. A

1976b *Globorotalites* sp. – Malumián & Masiuk, p. 195, pl. 4, fig. 3.

Occurrence. Santonian–Campanian (East well).

Globorotalites spp.

Occurrence. Coniacian (West well).

Family ANOMALINIDAE Cushman, 1927

Genus ***Anomalina*** d'Orbigny, 1826

Type species. *Anomalina ariminensis* d'Orbigny *in* Fornasini, 1902. Cretaceous to Holocene; cosmopolitan.

Anomalina cenomanica (Brotzen, 1945)

Figure 3.11

1945 *Cibicides (Cibicidoides) cenomanica* – Brotzen, p. 54, pl. 2, fig. 2a–c.
1959 *Anomalina cenomanica* (Brotzen) – Maslakova, p. 100, pl. 5, fig. 5.
1990 *Gavelinella cenomanica* (Brotzen) – Malumián, p. 451, pl. 9, fig. 1.

Remarks. This species was originally described as *Cibicides (Cibicidoides) cenomanica* Brotzen, 1945 and later reassigned to the genus *Gavelinella* by Malumián (1990). However, due to its raised sutures, the equally fine perforation on both sides, and its aperture extending further onto the spiral side, it must be placed under the genus *Anomalina* (see also Hayward *et al.*, 2018).

Occurrence. Albian (East well).

Genus ***Anomalinoides*** Brotzen, 1942

Type species. *Anomalinoides plummerae* Brotzen, 1942. Lower Cretaceous to Holocene; cosmopolitan.

Anomalinoides indicus (Sastry & Sastri, 1966)

1966 *Anomalina indica* – Sastry & Sastri, p. 293, pl. 19, fig. 10a–c.
1974 *Anomalina indica* Sastry & Sastri – Scheibnerová, p. 714, pl. 5, figs. 13–17; pl. 11, figs. 7a–c.
1978 *Anomalina indica* Sastry & Sastri – Scheibnerová, p. 746, pl. 4, figs. 19–20.
1983 *Anomalinoides indica* (Sastry & Sastri) – Basov & Krasheninnikov, p. 765, pl. 3, figs. 5–7.

Remarks. Although originally described as *Anomalina indica* Sastry & Sastri, 1974 and accepted by Scheibnerová (1974, 1978) (see also Hayward *et al.*, 2018), this species is here listed under the genus *Anomalinoides* due to its lobulate outline, its depressed sutures, and the lack of a large umbilical plug (see also Basov & Krasheninnikov, 1983).

Occurrence. Albian (West well).

Anomalinoides murchisonensis Belford, 1960

Figure 3.12

1960 *Anomalinoides murchisonensis* – Belford, p. 107, pl. 32, figs. 12–22.
1976b *Gavelinella murchisonensis* (Belford) – Malumián & Masiuk, p. 200, pl. 5, fig. 1.

Occurrence. Coniacian–Santonian (West well), Albian–Campanian (North well), Santonian–Campanian (East well).

Genus ***Orithostella*** Eicher & Worstell, 1970

Type species. *Orithostella viriola* Eicher & Worstell, 1970. Lower Cretaceous to Upper Cretaceous; cosmopolitan.

Orithostella indica Scheibnerová, 1974

Figure 3.13

1974 *Orithostella indica* – Scheibnerová, p. 715, pl. 7, figs. 4, 8–13; pl. 8, figs. 1–9; pl. 11, fig. 9a–c.
1978 *Orithostella indica* Scheibnerová – Scheibnerová, p. 747, pl. 3, figs. 9–11, 14–16.

Occurrence. Aptian–Albian (East well).

Family GAVELINELLIDAE Hofker, 1956

Subfamily GAVELINELLINAE Hofker, 1956

Genus ***Berthelina*** Malapris, 1965

Type species. *Anomalina intermedia* Berthelin, 1880. Lower Cretaceous; cosmopolitan.

Berthelina intermedia (Berthelin, 1880)

Figure 3.14

1880 *Anomalina intermedia* – Berthelin, p. 67, pl. 4, fig. 14.
1974 *Gavelinella* ex gr. *intermedia* (Berthelin) – Scheibnerová, p. 714, pl. 5, figs. 18–24; pl. 6, figs. 1–4.
1978 *Gavelinella* ex gr. *intermedia* (Berthelin) – Scheibnerová,

p. 747, pl. 2, figs. 12–14.
1987 *Berthelina intermedia* (Berthelin) – Loeblich & Tappan, p. 636, pl. 715, figs. 16–18.
1996 *Berthelina intermedia* (Berthelin) – Revets, p. 73, pl. 8, figs. 1–4.

Remarks. For a detailed taxonomic discussion about the validity of the genus *Berthelina* and its differences from *Gavelinella*, see Revets (1996).

Occurrence. Albian (North well), Albian–Cenomanian (East well).

Genus ***Gavelinella*** Brotzen, 1942

Type species. *Discorbina pertusa* Marsson, 1878. Lower Cretaceous to Paleocene; cosmopolitan.

Gavelinella berthelini (Keller, 1935)

1935 *Anomalina berthelini* – Keller, p. 558, pl. 3, figs. 25–27, pl. 4, figs. 12–13.
1976b *Gavelinella* (*Berthelina*) ex gr. *berthelini* (Keller) – Malumián & Masiuk, p. 200, pl. 5, figs. 3–5.

Occurrence. Coniacian–Santonian (West well), Albian (North well), Santonian–Campanian (East well).

Gavelinella compressa Sliter, 1968

1968 *Gavelinella compressa* – Sliter, p. 122, pl. 24, fig. 2.
1983 *Gavelinella compressa* Sliter – Basov & Krasheninnikov, p. 765, pl. 10, figs. 2–4.

Occurrence. Campanian (North well).

Gavelinella eriksdalensis (Brotzen, 1936)

Figure 3.15

1936 *Cibicides (Cibicidoides) eriksdalensis* – Brotzen, p. 193, pl. 14, fig. 5.
1960 *Anomalinoides eriksdalensis* (Brotzen) – Belford, p. 108, pl. 34, figs. 1–11.
1976b *Gavelinella eriksdalensis* (Brotzen) – Malumián & Masiuk, p. 199, pl. 1, fig. 12.

Remarks. This species was originally described as *Cibicides* (*Cibicidoides*) *eriksdalensis* Brotzen, 1936, because of its coarsely perforated umbilical side and the peripheral aperture, as pictured by Belford (1960) (see also Hayward *et al.*, 2018). However, due to the presence of umbilical flaps covering the aperture that extends onto the umbilical side, it must be placed under the genus *Gavelinella*, following the designation by Malumián & Masiuk (1976b).

Occurrence. Santonian–Campanian (West well), Coniacian–Campanian (North well).

Gavelinella whitei (Martin, 1964)

1964 *Anomalina whitei* – Martin, p. 106, pl. 16, fig. 4a–c.
1968 *Gavelinella whitei* (Martin) – Sliter, p. 126, pl. 24, fig. 1.
1983 *Gavelinella whitei* (Martin) – Basov & Krasheninnikov, p. 765, pl. 10, figs. 7–9.

Remarks. This species was originally described as *Anomalina whitei* Martin, 1964 (see also Hayward *et al.*, 2018). However, due to the extension of the aperture onto the umbilical side, its depressed sutures, and the lack of a large umbilical plug, it must be placed under the genus *Gavelinella*, following the designations by Sliter (1968) and Basov & Krasheninnikov (1983).

Occurrence. Albian (North well).

Gavelinella spp.

Occurrence. Albian–Santonian (West well), Albian–Campanian (North well), Albian–Coniacian (East well).

Genus ***Gyroidina*** d'Orbigny, 1826

Type species. *Gyroidina orbicularis* d'Orbigny, 1826. Cretaceous to Holocene; cosmopolitan.

Gyroidina depressa (Alth, 1850)

1850 *Rotalina depressa* – Alth, p. 266, pl. 13, fig. 21.
1946 *Gyroidina depressa* (Alth) – Cushman, p. 139, pl. 58, figs. 1–4.

Occurrence. Albian (North well).

Gyroidina exserta Belford, 1960

Figure 3.16

1960 *Gyroidina exserta* – Belford, p. 80, pl. 22, figs. 1–6.

Occurrence. Albian–Campanian (West and North well).

Gyroidina noda Belford, 1960

1960 *Gyroidina noda* – Belford, p. 79, pl. 21, figs. 16–27.
1976b *Gyroidinoides nodus* (Belford) – Malumián & Masiuk,

p. 194, pl. 4, fig. 4.

Occurrence. Santonian (West well), Albian–Santonian (North well), Santonian–Campanian (East well).

Gyroidina spp.

Occurrence. Coniacian–Santonian (North well).

Genus ***Lingulogavelinella*** Brotzen, 1942

Type species. *Lingulogavelinella albiensis* Malapris, 1965. Lower Cretaceous to Upper Cretaceous; cosmopolitan.

Lingulogavelinella globosa (Brotzen, 1945)

Figure 3.17

1945 *Anomalinoides globosa* – Brotzen, p. 55, pl. 2, fig. 6a–c.
1976a *Lingulogavelinella globosa* (Brotzen) – Malumián & Masiuk, p. 404, pl. 2, fig. 2; pl. 4, fig. 3a–b.

Occurrence. Albian (North well).

Lingulogavelinella magallanica Malumián & Masiuk, 1976a

Figure 3.18

1976a *Lingulogavelinella magallanica* – Malumián & Masiuk, p. 403, pl. 2, fig. 1a–c; pl. 4, fig. 6.

Remarks. Endemic species of the Magallanes Basin, indicative of the Albian.

Occurrence. Albian (North and East wells).

Genus ***Notoplanulina*** Malumián & Masiuk, 1976b

Type species. *Planulina rakauroana* Finlay, 1939. Upper Cretaceous; New Zealand, Argentina, USA.

Notoplanulina rakauroana (Finlay, 1939)

Figure 3.19

1939 *Planulina rakauroana* – Finlay, p. 326, pl. 29, figs. 154–156.
1976b *Notoplanulina rakauroana* (Finlay) – Malumián & Masiuk, p. 197, pl. 6, fig. 2.
1987 *Notoplanulina rakauroana* (Finlay) – Loeblich & Tappan, p. 634, pl. 713, figs. 1–6.

Occurrence. Coniacian (West well), Coniacian–Campanian (North well).

Superfamily NONIONOIDEA Schultze, 1854

Family NONIONIDAE Schultze, 1854

Subfamily NONIONINAE Schultze, 1854

Genus ***Nonionella*** Cushman, 1926c

Type species. *Nonionella miocenica* Cushman, 1926c. Upper Cretaceous to Holocene; cosmopolitan.

Nonionella robusta Plummer, 1931

1931 *Nonionella robusta* – Plummer, p. 175, pl. 14, fig. 12.
1946 *Nonionella robusta* Plummer – Cushman, p. 100, pl. 43, figs. 21–23.

Occurrence. Santonian (North well).

Family PULLENIIDAE Schwager, 1877

Subfamily PULLENIINAE Schwager, 1877

Genus ***Pullenia*** Parker & Jones *in* Carpenter *et al.*, 1862

Type species. *Nonionina bulloides* d'Orbigny, 1846. Upper Cretaceous to Holocene; cosmopolitan.

Pullenia americana Cushman, 1936b

1936b *Pullenia americana* – Cushman, p. 76, pl. 13, figs. 4–5.
1946 *Pullenia americana* Cushman – Cushman, p. 146, pl. 60, figs. 13–14.
1960 *Pullenia americana* Cushman – Belford, p. 89, pl. 24, figs. 16–18.

Occurrence. Campanian (West well).

Pullenia cretacea Cushman, 1936b

Figure 3.20

1936b *Pullenia cretacea* – Cushman, p. 75, pl. 13, fig. 8.
1946 *Pullenia cretacea* Cushman – Cushman, p. 146, pl. 60, fig. 9.
1960 *Pullenia cretacea* Cushman – Belford, p. 88, pl. 24, figs. 13–15.
1968 *Pullenia cretacea* Cushman – Sliter, p. 115, pl. 21, fig. 2.

Occurrence. Campanian (West and North wells).

Phylum HAPTOPHYTA Hibberd *ex* Edvardsen & Eikrem *in* Edvardsen *et al.*, 2000

Class COCCOLITHOPHYCEAE Rothmaler, 1951

Subclass PRYMNESIOPHYCIDAE Cavalier-Smith, 1986
HETEROCOCCOLITHS
Order EIFFELLITHALES Rood, Hay & Barnard, 1971
Family CHIASTOZYGACEAE Rood, Hay & Barnard, 1973
emend. Varol & Girgis, 1994

Genus ***Ahmuellerella*** Reinhardt, 1964 *emend.* Hoffmann, 1970a

Type species. *Ahmuellerella limbitenuis* Reinhardt, 1964. Cenomanian–Maastrichtian; cosmopolitan.

Ahmuellerella octoradiata (Górka, 1957)
Reinhardt & Górka, 1967
Figure 4.1–2

1957 *Discolithus octoradiatus* – Górka, p. 259, pl. 4, fig. 10.
1963 *Zygolithus octoradiatus* (Górka) – Stradner, p. 14, pl. 5, figs. 2, 2a.
1966a *Ahmuellerella octoradiata* (Górka) – Reinhardt, p. 24, pl. 22, figs. 3–4.
1984 *Ahmuellerella octoradiata* (Górka) Reinhardt – Malumián *et al.*, p. 515, pl. 1, fig. 1.
2010 *Ahmuellerella octoradiata* (Górka) Reinhardt – Pérez Panera, p. 66–67, pl. 1, fig. 1.

Occurrence. Campanian–Maastrichtian (East well), Cenomanian–Campanian (North and East wells).

Genus ***Staurolithites*** Caratini, 1963

Type species. *Staurolithites laffittei* Caratini, 1963. Albian–Maastrichtian; cosmopolitan.

Staurolithites crux (Deflandre *in* Deflandre & Fert, 1954) Caratini, 1963

1954 *Discolithus crux* – Deflandre *in* Deflandre & Fert, p. 143, pl. 14, fig. 4.
1961 *Zygolithus crux* (Deflandre *in* Deflandre & Fert) – Bramlette & Sullivan, p. 149, pl. 6, figs. 8–10.
1963 *Staurolithites crux* (Deflandre *in* Deflandre & Fert) – Caratini, p. 25.
2010 *Staurolithites crux* (Deflandre *in* Deflandre & Fert) Caratini – Pérez Panera, p. 68–69, pl. 1, figs. 6–10; pl. 28, fig. 1.

Remarks. Grün & Zweili (1980) mentioned that there were more described species of the genus *Staurolithites* than those that were possible to distinguish. On the other hand, many *Staurolithites* species are very similar at the optical microscope, and Perch-Nielsen (1985) stated that many times *Staurolithites crux* was indistinctly used for any elliptical loxolith with a cross aligned to the main axis of the ellipse. In this study, we apply this broad species concept to any simple *Staurolithites* without distinguishing features.

Occurrence. Coniacian–Santonian (West well), Hauterivian–Cenomanian (North well), Aptian–Campanian (East well).

Staurolithites gausorhethium (Hill, 1976)
Varol & Girgis, 1994

1976 *Vagalapilla gausorhethium* – Hill, p. 157, pl. 3, figs. 25–30.
1983 *Vekshinella gausorhethium* (Hill) – Doeven, p. 50.
1994 *Staurolithites gausorhethium* (Hill) – Varol & Girgis, p. 238, pl. 11, fig. 19.
2010 *Staurolithites gausorhethium* (Hill) Varol & Girgis – Pérez Panera, p. 69–70.

Remarks. This species has the cross slightly rotated from the main axis of the ellipse, and a bicyclic rim that shows high birefringence at polarized light.

Occurrence. Santonian (West well), Cenomanian (North well), Albian (East well).

Staurolithites laffittei Caratini, 1963

1963 *Staurolithites laffittei* – Caratini, p. 25, pl. 2, figs. 32–33.

Remarks. Small and elliptical loxolith with a simple cross aligned to the main axis of the ellipse. The cross and rim are birefringent, and it differs from *S. crux* by having a bicyclic rim.

Occurrence. Coniacian–Campanian (West well).

Staurolithites mutterlosei Crux, 1989

1989 *Staurolithites mutterlosei* – Crux, p. 194, pl. 8.6, figs. 7–8; pl. 8.12, figs. 16, 21–22.
2005 *Staurolithites mutterlosei* Crux – Bown, pl. 1, fig. 19.
2010 *Staurolithites mutterlosei* Crux – Pérez Panera, p. 73–74, pl. 2, figs. 2–3.

Remarks. Medium-sized and slightly elliptical loxolith with a bicyclic rim and a broad central area spanned by a cross slightly rotated from the main axis of the ellipse. With polarized light, the bicyclic rim showed a rotated interference and the inner cycle was interrupted at the contact with the cross.

Occurrence. Santonian (West well), Albian–Campanian (North and East wells).

Staurolithites zoensis Burnett, 1997

2010 *Staurolithites zoensis* Burnett – Pérez Panera, p. 74–75, pl. 2, figs. 4–5.

Remarks. Medium-sized loxolith with bicyclic rim and central cross with arms slightly twisted but aligned to the main axis of the ellipse.

Occurrence. Coniacian (West well).

Genus ***Misceomarginatus*** Wind & Wise *in* Wise & Wind, 1977

Type species. *Misceomarginatus pleniporus* Wind & Wise *in* Wise & Wind, 1977. Campanian–Maastrichtian; South Atlantic and Indian oceans.

Misceomarginatus sp. 1

Occurrence. Coniacian (West well).

Genus ***Placozygus*** Hoffmann, 1970b

Type species. *Glaukolithus* (?) *fibuliformis* Reinhardt, 1964. Turonian–Maastrichtian; cosmopolitan.

Placozygus fibuliformis (Reinhardt, 1964) Hoffmann, 1970b
Figure 4.3

1964 *Glaukolithus* (?) *fibuliformis* – Reinhardt, p. 758, pl. 1, fig. 4.
1969 *Zygodiscus fibuliformis* (Reinhardt) – Bukry, p. 59–60, pl. 34, figs. 9–10.
1970b *Placozygus fibuliformis* (Reinhardt) – Hoffmann, p. 1004, pl. 1, fig. 1.
2010 *Placozygus fibuliformis* (Reinhardt) Hoffmann – Pérez Panera, p. 77–78, pl. 2, fig. 10.

Occurrence. Coniacian (West well), Coniacian–Campanian (North and East wells).

Placozygus sigmoides (Bramlette & Sullivan, 1961) Romein, 1979
Figure 4.4

1961 *Zygodiscus sigmoides* – Bramlette & Sullivan, p. 149, pl. 4, fig. 11a–e.
1979 *Placozygus sigmoides* (Bramlette & Sullivan) – Romein, p. 117, pl. 1, fig. 8.
1987 *Placozygus sigmoides* (Bramlette & Sullivan) Romein – Angelozzi, p. 303–304, pl. 2, fig. 1.
1997 *Zeugrhabdotus sigmoides* (Bramlette & Sullivan) – Bown & Young, p. 22.
2010 *Placozygus sigmoides* (Bramlette & Sullivan) Romein – Pérez Panera, p. 78–79.

Occurrence. Campanian–Maastrichtian (West well).

Genus ***Zeugrhabdotus*** Reinhardt, 1965 *emend.* Black, 1973

Type species. *Zygolithus erectus* Deflandre *in* Deflandre & Fert, 1954. Pliensbachian–Maastrichtian; cosmopolitan.

Zeugrhabdotus angelozziae Pérez Panera, 2012b
Figure 4.5–6

2010 *Zeugrhabdotus* sp. 1 – Pérez Panera, p. 86, pl. 4, figs. 4–7.
2012b *Zeugrhabdotus angelozziae* – Pérez Panera, p. 76, pl. 1, figs. 1–12.

Remarks. Medium to large bicyclic loxolith with a bar oblique to length and divided longitudinally. This species is rare but characteristic of the Albian–Cenomanian in the Austral Basin (Pérez Panera, 2012b). It was recently found in the Albian of the Vocontian Basin, southeast France (Vincent *et al.*, 2020). In this study, it was found in condensed levels of Coniacian–Campanian age in the East well.

Occurrence. Coniacian–Campanian (East well).

Zeugrhabdotus bicrescenticus (Stover, 1966) Burnett *in* Gale *et al.*, 1996

1966 *Discolithus bicrescenticus* – Stover, p. 142, pl. 2, figs. 5–7; pl. 8, fig. 11.
1996 *Zeugrhabdotus bicrescenticus* (Stover) – Burnett *in* Gale *et al.*, p. 606, pl. 6, fig. D.
2010 *Zeugrhabdotus bicrescenticus* (Stover) Burnett *in* Gale *et al.* – Pérez Panera, p. 79–80, pl. 2, fig. 11.

Occurrence. Albian–Coniacian (West well), Cenomanian–Campanian (North well), Albian–Campanian (East well).

Zeugrhabdotus diplogrammus (Deflandre *in* Deflandre & Fert, 1954) Burnett *in* Gale *et al.*, 1996
Figure 4.7

1954 *Zygolithus diplogrammus* – Deflandre *in* Deflandre & Fert, p. 148, pl. 10, fig. 7.
1964 *Glaukolithus diplogrammus* (Deflandre *in* Deflandre &

Fert) – Reinhardt, p. 758.
1968 *Zygodiscus diplogrammus* (Deflandre *in* Deflandre & Fert) – Gartner, p. 32, pl. 14, fig. 18; pl. 17, fig. 4; pl. 19, fig. 3; pl. 21, fig. 2; pl. 22, fig. 7; pl. 23, figs. 12–14; pl. 24, fig. 6; pl. 35, figs. 17–18.
1969 *Zygolithus diplogrammus* Deflandre – Malumián, p. 121, pl. 2, fig. 4.
1996 *Zeugrhabdotus diplogrammus* (Deflandre *in* Deflandre & Fert) – Burnett *in* Gale *et al.*, p. 606, pl. 6, fig. e.
2010 *Zeugrhabdotus diplogrammus* (Deflandre *in* Deflandre & Fert) Burnett *in* Gale *et al.* – Pérez Panera, p. 80–81, pl. 2, figs. 12–14; pl. 26, figs. 7–8.

Occurrence. Valanginian–Campanian (West well), Hauterivian–Campanian (North well), Albian–Campanian (East well).

Zeugrhabdotus embergeri (Noël, 1958) Perch-Nielsen, 1984

1958 *Discolithus embergeri* – Noël, p. 164–165, pl. 1, figs. 5–8.
1963 *Parhabdolithus embergeri* (Noël) – Stradner, pl. 4, fig. 1.
1984 *Zeugrhabdotus embergeri* (Noël) – Perch-Nielsen, p. 44.
2009 *Zeugrhabdotus embergeri* (Noël) Perch-Nielsen – Lescano & Concheyro, p. 78, pl. 3, fig. 5.
2010 *Zeugrhabdotus embergeri* (Noël) Perch-Nielsen – Pérez Panera, p. 82–83, pl. 3, figs. 4–7.

Occurrence. Aptian–Albian (West well).

Zeugrhabdotus erectus (Deflandre *in* Deflandre & Fert, 1954) Reinhardt, 1965

1954 *Zygolithus erectus* – Deflandre *in* Deflandre & Fert, p. 150, pl. 15, figs. 14–17.
1965 *Zeugrhabdotus erectus* (Deflandre *in* Deflandre & Fert) – Reinhardt, p. 37.
1965a *Zygolithus bussoni* – Noël, p. 3, fig. 1a–c.
1965a *Discolithus salillum* – Noël, p. 4, figs. 5–6.
2010 *Zeugrhabdotus erectus* (Deflandre *in* Deflandre & Fert) Reinhardt – Pérez Panera, p. 83–84, pl. 3, figs. 8–10.

Occurrence. Aptian–Coniacian (West well), Valanginian–Albian (North well), Albian–Cenomanian (East well).

Zeugrhabdotus noeliae Rood *et al.*, 1971

Figure 4.8

1971 *Zeugrhabdotus noeli* Rood *et al.*, p. 252–253, pl. 1, fig. 4.
1982 *Zygodiscus noelae* (Rood *et al.*) – Taylor *in* Crux *et al.*, p. 99.
1998 *Zeugrhabdotus noeliae* Rood *et al.* – Burnett, pl. 6.2, fig. 19a–b.

Occurrence. Albian–Cenomanian (North well), Albian (East well).

Zeugrhabdotus scutula (Bergen, 1994) Rutledge & Bown, 1996

Figure 4.9–10

1994 *Reinhardtites scutula* – Bergen, p. 64, 69, pl. 1, figs. 24a–c, 25a–b.
1996 *Zeugrhabdotus scutula* (Bergen) – Rutledge & Bown, p. 56.
2010 *Zeugrhabdotus scutula* (Bergen) Rutledge & Bown – Pérez Panera, p. 85–86, pl. 3, figs. 12–14; pl. 27, fig. 1.

Occurrence. Coniacian–Campanian (West well), Albian–Coniacian (North well), Albian–Cenomanian (East well).

Zeugrhabdotus trivectis Bergen, 1994

Figure 4. 11

1994 *Zeugrhabdotus trivectis* – Bergen, p. 65, pl. 1, figs. 26a–b, 27a–c.

Occurrence. Valanginian–Coniacian (West well), Valanginian–Cenomanian (North well), Albian–Cenomanian (East well).

Genus ***Reinhardtites*** Perch-Nielsen, 1968

Type species. *Rhabdolithus anthophorus* Deflandre, 1959. Turonian–Campanian; cosmopolitan.

Reinhardtites anthophorus (Deflandre, 1959) Perch-Nielsen, 1968

Figure 4.12

1959 *Rhabdolithus anthophorus* – Deflandre, p. 137, pl. 1, figs. 21–22.
1968 *Reinhardtites anthophorus* (Deflandre) – Perch-Nielsen, p. 38–39, pl. 5, figs. 1, 5–6.
1969 *Zygodiscus meudini* – Bukry, p. 60, pl. 35, figs. 5–8.
1977 *Zygodiscus anthophorus* (Deflandre) – Wind & Wise *in* Wise & Wind, p. 308–309, pl. 43, figs. 1–4
2010 *Reinhardtites anthophorus* (Deflandre) Perch-Nielsen – Pérez Panera, p. 88–89, pl. 4, figs. 8–10.

Remarks. *Reinhardtites anthophorus* is a good marker to identify the late Campanian in the Magallanes Basin (Pérez Panera, 2012a). Its abundance is low, but it is consistent within the Campanian, and its LO is a reliable event for the correlation of Campanian successions.

Occurrence. Coniacian–Campanian (West and North wells).

Reinhardtites levis Prins & Sissingh *in* Sissingh, 1977

1968 *Reinhardtites anthophorus* (Deflandre) – Perch-Nielsen, pl. 5, figs. 2–4, 7–8, text. figs. 13–14 (partim).
1973 *Zygodiscus* sp. – Risatti, pl. 10, figs. 18–19.
1977 *Reinhardtites levis* – Prins & Sissingh *in* Sissingh, p. 61, pl. 1, figs. 1–3.
2010 *Reinhardtites levis* Prins & Sissingh *in* Sissingh – Pérez Panera, p. 89–90, pl. 4, fig. 11.

Remarks. In the southeastern part of the Magallanes Basin (Austral Basin), this species is consistent in the late Campanian–early Maastrichtian (Pérez Panera, 2010, 2012a) and its LO has been proposed as a reliable event for the early Maastrichtian in the South Atlantic (Watkins *et al.*, 1996; Burnett, 1998; Monte Guerra *et al.*, 2016). However, in this study, it appears sporadically in samples with *R. anthophorus,* which LO is in the late Campanian.

Occurrence. Coniacian–Campanian (West well).

Genus ***Tranolithus*** Stover, 1966

Type species. *Tranolithus manifestus* Stover, 1966. Albian–Maastrichtian; cosmopolitan.

Tranolithus gabalus Stover, 1966

1966 *Tranolithus gabalus* – Stover, p. 146, pl. 4, fig. 22; pl. 9, fig. 5.
1973 *Tranolithus gabalus* Stover – Thierstein, p. 38.

Occurrence. Coniacian (West well).

Tranolithus cf. ***minimus*** (Bukry, 1969) Perch-Nielsen, 1984

Occurrence. Aptian (West well).

Tranolithus orionatus (Reinhardt, 1966a) Reinhardt, 1966b

1966a *Discolithus orionatus* – Reinhardt, p. 42, pl. 23, figs. 22, 31–33.
1966b *Tranolithus orionatus* (Reinhardt) – Reinhardt, p. 522.
1966 *Tranolithus phacelosus* – Stover, p. 146, pl. 9, fig. 7.
1970a *Zygostephanus orionatus* (Reinhardt) – Hoffmann, p. 178, pl. 1, fig. 5; pl. 2, fig. 3.
1977 *Tranolithus orionatus* (Reinhardt) Reinhardt – Wise & Wind, p. 307, pl. 57, figs. 1–4.
2010 *Tranolithus orionatus* (Reinhardt) Reinhardt – Pérez Panera, p. 91–92, pl. 4, fig. 14; pl. 27, fig. 3.

Remarks. This species is consistent and abundant throughout the Albian–Campanian in the Austral Basin (Pérez Panera, 2010, 2012a). Its LO defines the top of UC17 Biozone of Burnett (1998), close to the Campanian/Maastrichtian boundary, according to new age calibrations (Ogg *et al.*, 2016). This event is highlighted here for correlation within the Magallanes Basin.

Occurrence. Albian–Campanian (West, North and East wells).

Genus ***Chiastozygus*** Gartner, 1968

Type species. *Zygodiscus*? *amphipons* Bramlette & Martini, 1964. Santonian–Maastrichtian; cosmopolitan.

Chiastozygus bifarius Bukry, 1969

1969 *Chiastozygus bifarius* – Bukry, p. 49, pl. 26, figs. 10–12.
1982 *Helicolithus bifarius* (Bukry) Crux – Crux, p. 116, pl. 5.3, figs. 6, 10.
2010 *Chiastozygus bifarius* Bukry – Pérez Panera, p. 93–94.

Occurrence. Coniacian (West well), Albian–Cenomanian (North well).

Chiastozygus litterarius (Górka, 1957) Manivit, 1971

1957 *Discolithus litterarius* – Górka, p. 251, 274, pl. 3, fig. 3.
1967 *Zygolithus litterarius* (Górka) – Reinhardt & Górka, p. 249, pl. 33, fig. 7.
1968 *Zygolithus litterarius* (Górka) – Stradner *et al.*, p. 39, pl. 34, figs. 1–7.
1970a *Zygostephanos litterarius* (Górka) – Hoffmann, p. 177, pl. 5, fig. 4; pl. 6, fig. 4b; pl. 10, fig. 1.
1971 *Chiastozygus litterarius* (Górka) – Manivit, p. 92, pl. 4, figs. 1–5.
1984 *Chiastozygus litterarius* (Górka) Manivit – Malumián *et al.*, p. 515, pl. 1, fig. 7.
2010 *Chiastozygus litterarius* (Górka) Manivit – Pérez Panera, p. 95–96, pl. 5, figs. 1–3.

Occurrence. Coniacian (West well), Cenomanian–Campanian (North and East wells).

Chiastozygus stylesii Burnett, 1997
Figure 4.13–14

1997 *Chiastozygus stylesii* – Burnett, p. 140, pl. 1, fig. 9a–b

Remarks. This is the first mention for this species in the basin and its presence is useful for identifying the Coniacian.

Occurrence. Coniacian (West well).

Genus ***Loxolithus*** Noël, 1965b

Type species. ***Cyclolithus armilla*** Black *in* Black & Barnes, 1959. Hauterivian–Maastrichtian; cosmopolitan.

Loxolithus armilla (Black *in* Black & Barnes, 1959) Noël, 1965b

1959 *Cyclolithus armilla* Black *in* Black & Barnes, p. 327, pl. 12, fig. 2.
1965a *Loxolithus armilla* (Black *in* Black & Barnes) – Noël, p. 3 (Invalid, International Code of Botanical Nomenclature (ICBN) Arts. 33.4 and 43).
1965b *Loxolithus armilla* (Black *in* Black & Barnes) – Noël, p. 67, fig. 3.
2010 *Loxolithus armilla* (Black *in* Black & Barnes) Noël – Pérez Panera, p. 99–100, pl. 5, figs. 7–8.

Occurrence. Campanian (West well), Albian–Campanian (North well), Albian (East well).

Family EIFFELLITHACEAE Reinhardt, 1965

Genus ***Diloma*** Wind & Čepek, 1979

Type species. *Arkhangelskiella primitiva* Worsley, 1971. Valanginian–Aptian; cosmopolitan.

Diloma primitiva (Worsley, 1971) Wind & Čepek, 1979
Figure 4.15–16

1971 *Arkhangelskiella primitiva* – Worsley, p. 1306, pl. 1, figs. 1–3.
1979 *Diloma primitiva* (Worsley) – Wind & Čepek, p. 228, pl. 8, figs. 2–3.
2010 *Diloma primitiva* (Worsley) Wind & Čepek – Pérez Panera, p. 100–101.

Occurrence. Aptian (West well), Valanginian–Hauterivian (North well).

Genus ***Eiffellithus*** Reinhardt, 1965 *emend.* Perch-Nielsen, 1968

Type species. *Zygolithus turriseiffeli* Deflandre *in* Deflandre & Fert, 1954. Albian–Maastrichtian; cosmopolitan.

Eiffellithus eximius (Stover, 1966) Perch-Nielsen, 1968
Figure 4.17

1966 *Clinorhabdus eximius* – Stover, p. 138, pl. 2, figs. 15–16; pl. 8, fig. 15.
1968 *Eiffellithus eximius* (Stover) – Perch-Nielsen, p. 30, pl. 3, figs. 8–10.
2010 *Eiffellithus eximius* (Stover) Perch-Nielsen – Pérez Panera, p. 101–102, pl. 5, figs. 9–11.

Occurrence. Coniacian–Campanian (West well), Cenomanian–Campanian (North and East wells).

Eiffellithus gorkae Reinhardt, 1965

1965 *Eiffellithus gorkae* – Reinhardt, p. 36, pl. 2, fig. 2.
2010 *Eiffellithus gorkae* Reinhardt – Pérez Panera, p. 102, pl. 5, figs. 12–15; pl. 6, fig. 1; pl. 28, figs. 2–3.

Occurrence. Coniacian–Maastrichtian (West well), Cenomanian–Campanian (North well), Coniacian–Campanian (East well).

Eiffellithus paragogus Gartner *in* Robaszynski *et al.*, 1993

1993 *Eiffellithus paragogus* – Gartner *in* Robaszynski *et al.*, p. 443, pl. 24, fig. 6a–c.
1996 *Bownia glabra* – Jeremiah, p. 125, pl. 3, fig. 20.
1997 *Staurolithites glabra* (Jeremiah) – Burnett, p. 140.
2010 *Staurolithites glabra* (Jeremiah) Burnett – Pérez Panera, p. 70–71, pl. 1, fig. 11.

Occurrence. Aptian (West well).

Eiffellithus turriseiffelii (Deflandre *in* Deflandre & Fert, 1954) Reinhardt, 1965
Figure 4.18

1954 *Zygolithus turriseiffelli* – Deflandre *in* Deflandre & Fert, p. 149, pl. 13, figs. 15–16.
1965 *Eiffellithus turriseiffelii* (Deflandre *in* Deflandre & Fert) – Reinhardt, p. 336.
1966 *Clinorhabdus turriseiffelii* – Stover, p. 138, pl. 3, figs. 7–9.
1969 *Eiffellithus turriseiffelii* (Deflandre *in* Deflandre & Fert) Reinhardt – Malumián, p. 123–124, pl 5, fig. 1.
2010 *Eiffellithus turriseiffelii* (Deflandre *in* Deflandre & Fert) Reinhardt – Pérez Panera, p. 104–105, pl. 6, figs. 5–8; pl. 27, fig. 4.

Occurrence. Albian–Maastrichtian (West well), Albian–Campanian (North and East wells).

Eiffellithus striatus (Black, 1971) Applegate & Bergen, 1988
Figure 4.19–20

1971 *Chiastozygus striatus* – Black, p. 416, pl. 34, fig. 7.
1981 *Chiastozygus tripes* – Köthe, p. 22, pl. 3, figs. 1–5, text-fig. 20.

1988 *Chiastozygus striatus* (Black) – Applegate & Bergen, p. 315.

Remarks. This species is a good marker for the Valanginian/Hauterivian boundary (Bown *et al.*, 1998), but its occurrence in Magallanes Basin is sporadic and rare.

Occurrence. Valanginian–Hauterivian (West and North wells).

Genus ***Helicolithus*** Noël, 1970

Type species. *Discolithus anceps* Górka, 1957. Cenomanian–Maastrichtian; cosmopolitan.

Helicolithus anceps (Górka, 1957) Noël, 1970

1957 *Discolithus anceps* – Górka, p. 275, pl. 3, fig. 4.
1970 *Helicolithus anceps* (Górka) – Noël, p. 41, pl. 8, figs. 1–5; pl. 1, figs. 1–2.

Occurrence. Coniacian (West well), Albian (North well), Cenomanian–Campanian (East well).

Helicolithus trabeculatus (Górka, 1957) Verbeek, 1977
Figure 5.1–2

1957 *Discolithus trabeculatus* – Górka, p. 277, pl. 3, fig. 9.
1967 *Eiffellithus trabeculatus* (Górka) – Reinhardt & Górka, p. 241, 250, pl. 31, figs. 19, 23; pl. 32, fig. 1; text. fig. 5.
1973 *Chiastozygus trabeculatus* (Górka) – Risatti, p. 23.
1977 *Helicolithus trabeculatus* (Górka) – Verbeek, p. 90.
2010 *Helicolithus trabeculatus* (Górka) Verbeek – Pérez Panera, p. 107, pl. 6, fig. 12.

Occurrence. Aptian–Campanian (West and North wells), Coniacian–Campanian (East well).

Helicolithus turonicus Varol & Girgis, 1994
Figure 5.3

1994 *Helicolithus turonicus* – Varol & Girgis, p. 235, pl. 10, figs. 1–7.

Remarks. This species is restricted to the Turonian stage (Burnett, 1998). This represents the first record in the Magallanes Basin, but it appears in assemblages with other younger taxa. According to Pérez Panera (2012a), the Turonian is not present in the eastern Magallanes Basin. These wells are located to the West, in a deeper position in the basin and it is possible that there is a condensed Turonian interval, or that some Turonian sediments are reworked in younger ones.

Occurrence. Coniacian? (North and East wells).

Family RHAGODISCACEAE Hay, 1977

Genus ***Rhagodiscus*** Reinhardt, 1967

Type species. *Discolithus asper* Stradner, 1963. Tithonian–Cenomanian; cosmopolitan.

Rhagodiscus achlyostaurion (Hill, 1976) Doeven, 1983
Figure 5.4

1976 *Parhabdolithus achlyostaurion* – Hill, p. 145, pl. 9, figs. 24–29.
1983 *Rhagodiscus achlyostaurion* (Hill) – Doeven, p. 50.

Occurrence. Santonian (West well).

Rhagodiscus angustus (Stradner, 1963) Reinhardt, 1971

1963 *Rhabdolithus angustus* – Stradner, p. 178, pl. 5, fig. 6.
1968 *Parhabdolithus angustus* (Stradner) – Stradner *et al.*, p. 32, pl. 20.
1971 *Rhagodiscus angustus* (Stradner) – Reinhardt, p. 23.
1995 *Rhagodiscus angustus* (Stradner) Reinhardt – Concheyro, p. 50, pl. 6, figs. 7–8; pl. 10, fig. 3; pl. 11, fig. 2.
2010 *Rhagodiscus angustus* (Stradner) Reinhardt – Pérez Panera, p. 111, pl. 7, figs. 6–8.

Occurrence. Albian–Santonian (West well), Aptian–Campanian (North and East wells).

Rhagodiscus asper (Stradner, 1963) Reinhardt, 1967
Figure 5.5

1963 *Discolithus asper* – Stradner, p. 11, pl. 2, figs. 4–5.
1967 *Rhagodiscus asper* (Stradner) – Reinhardt, p. 167.
1968 *Rhagodiscus asper* (Stradner) Reinhardt – Stradner *et al.*, p. 33, pl. 24, figs. 1–4.
2010 *Rhagodiscus asper* (Stradner) Reinhardt – Pérez Panera, p. 111–112, pl. 7, figs. 9–15.

Occurrence. Aptian–Coniacian (West well), Valanginian–Cenomanian (North well), Aptian–Albian (East well).

Rhagodiscus plebeius Perch-Nielsen, 1968

1968 *Rhagodiscus plebeius* – Perch-Nielsen, p. 44, pl. 7, figs. 2–6.

Occurrence. Santonian (West well).

Rhagodiscus splendens (Deflandre, 1953) Verbeek, 1977

1953 *Rhabdolithus splendens* – Deflandre, p. 1785, text. figs. 4–6.
1964 *Cretarhabdus splendens* (Deflandre) – Bramlette & Martini, p. 300, pl. 3, figs. 13–16.
1968 *Actinozygus splendens* (Deflandre) – Gartner, p. 25, pl. 5, figs. 15–16; pl. 7, figs. 1–2; pl. 11, fig. 15.
1969 *Parhabdolithus splendens* (Deflandre) – Noël, p. 476, pl. 1, figs. 1–4, 7.
1977 *Rhagodiscus splendens* (Deflandre) – Verbeek, p. 94.
2010 *Rhagodiscus splendens* (Deflandre) Verbeek – Pérez Panera, p. 114, pl. 8, figs. 3–4.

Occurrence. Coniacian (West well).

Order STEPHANOLITHIALES Bown & Young, 1997
Family STEPHANOLITHIACEAE Black, 1968

Genus ***Corollithion*** Stradner, 1961

Type species. *Corollithion exiguum* Stradner, 1961. Turonian–Maastrichtian; cosmopolitan.

Corollithion kennedyi Crux, 1981
Figure 5.6

1981 *Corollithion kennedyi* – Crux, p. 635, pl. 1, figs. 4–5; pl. 2, figs. 4–5.

Remarks. This species is rare in the Magallanes Basin assemblages, but it is a very good marker for the Cenomanian (Burnett, 1998).

Occurrence. Cenomanian (East well).

Genus ***Rotelapillus*** Noël, 1973 *emend.* Rahman & Roth, 1992

Type species. *Rotelapillus radians* Noël, 1973. Tithonian; cosmopolitan.

Rotelapillus crenulatus (Stover, 1966) Perch-Nielsen, 1984

not 1957 *Stephanolithion laffittei* – Noël, p. 318–319, pl. 2, figs. 5–6.
1963 *Stephanolithion laffittei* Noël – Stradner, p. 175, pl. 1, fig. 14a–b.
1964 *Stephanolithion laffittei* Noël – Bramlette & Martini, p. 320, pl. 6, figs. 12–15.
1966 *Stephanolithion crenulatum* – Stover, p. 160, pl. 7, figs. 25–27; pl. 9, figs. 25–27.
1971 *Stephanolithion laffittei* Noël – Shafik & Stradner, p. 89, pl. 47, fig. 2.
non 1973 *Cylindralithus laffittei* (Noël) – Black, p. 95–96, pl. 29, figs. 1–6, text. figs. 4–6.
1973 *Rotelapillus laffittei* (Noël) – Noël, p. 107.
1974 *Rotelapillus laffittei* (Noël) Noël – Müller, p. 589, pl. 17, figs. 3–4.
1984 *Rotelapillus octoradiatus* (Gartner) – Perch-Nielsen, p. 44.
1984 *Rotelapillus crenulatus* (Stover) – Perch-Nielsen, p. 43.
2010 *Rotelapillus laffittei* (Nöel) Nöel – Pérez Panera, p. 115–116, pl. 8, figs. 5–12.

Remarks. The name *Rotellapillus laffittei* has been widely used in the literature to refer to *Rotelapillus crenulatus.* According to Bown & Cooper (1998), the type specimen of *Rotelapillus laffittei* (which the illustrations are sketches) might be a badly preserved *Stephanolithion bigotii.* In any case, the name *R. laffittei* has been used to refer to *R. crenulatus*-like coccoliths, while the holotype sketches of *R. laffittei* are quite different. For instance, it shows two crossbars instead of four.

Occurrence. Cenomanian–Campanian (East well).

Genus ***Stradnerlithus*** Black, 1971

Type species. *Stradnerlithus comptus* Black, 1971. Toarcian–Tithonian; North Atlantic Ocean, Tethys.

Stradnerlithus sp.

Occurrence. Santonian (West well).

Order PODORHABDALES Rood, Hay & Barnard, 1971 *emend.* Bown, 1987
Family AXOPODORHABDACEAE Bown & Young, 1997

Genus ***Axopodorhabdus*** Wind & Wise *in* Wise & Wind, 1977

Type species. *Podorhabdus cylindralithus* Noël, 1965a. Bajocian–Tithonian; cosmopolitan.

Axopodorhabdus albianus (Black, 1967) Wind & Wise, 1983
Figure 5.7–8

1965 *Rhabdosphaera* sp. – Black, p. 133, pl. 1, fig. 10.
1967 *Podorhabdus albianus* – Black, p. 143–144.
1977 *Axopodorhabdus albianus* (Black) – Wind & Wise *in* Wise & Wind, p. 297 (invalid ICBN Art. 33.2).
1983 *Axopodorhabdus albianus* (Black) – Wind & Wise, p. 557.

2010 *Axopodorhabdus albianus* (Black, 1967) Wind & Wise – Pérez Panera, p. 117–118, pl. 9, fig. 1; not pl. 8, figs. 13–5.

Remarks. This species has a consistent record in the middle Albian to Cenomanian in the Magallanes Basin, and its LO is a useful event for regional correlation.

Occurrence. Albian–Cenomanian (North well), Albian–Cenomanian (East well).

Genus ***Cribrosphaerella*** Deflandre *in* Piveteau, 1952

Type species. *Cribrosphaera ehrenbergii* Arkhangelsky, 1912. Albian–Maastrichtian; cosmopolitan.

Cribrosphaerella ehrenbergii (Arkhangelsky, 1912) Deflandre *in* Piveteau, 1952

Figure 5.9

1912 *Cribrosphaera ehrenbergii* – Arkhangelsky, p. 412, pl. 6, figs. 19–20.
1952 *Cribrosphaerella ehrenbergii* (Arkhangelsky) – Deflandre *in* Piveteau, p. 111, text. fig. 54.
1984 *Cribrosphaerella ehrenbergii* (Arkhangelsky) – Deflandre *in* Piveteau – Malumián *et al.*, p. 515, pl. 1, fig. 6.
2010 *Cribrosphaerella ehrenbergii* (Arkhangelsky) Deflandre *in* Piveteau – Pérez Panera, p. 120–121, pl. 9, figs. 11–14.

Occurrence. Coniacian (West well), Cenomanian–Campanian (North well).

Genus ***Octocyclus*** Black, 1972

Type species. *Octocyclus magnus* Black, 1972. Albian–Maastrichtian; cosmopolitan.

Octocyclus reinhardtii (Bukry, 1969) Wind & Wise *in* Wise & Wind, 1977

Figure 5.10

1969 *Podorhabdus reinhardtii* – Bukry, p. 38, pl. 16, fig. 7.
1977 *Octocyclus reinhardtii* (Bukry) – Wind & Wise *in* Wise & Wind, p. 302, pl. 57, fig. 6; pl. 58, figs. 1–2.
2010 *Octocyclus reinhardtii* (Bukry, 1969) Wind & Wise *in* Wise & Wind – Pérez Panera, p. 124–125.

Occurrence. Aptian (West).

Family BISCUTACEAE Black, 1971

Genus ***Biscutum*** Black *in* Black & Barnes, 1959

Type species. *Biscutum testudinarium* Black *in* Black & Barnes, 1959. Bathonian–Maastrichtian; cosmopolitan.

Biscutum constans (Górka, 1957) Black, 1967

Figure 5.11

1957 *Discolithus constans* – Górka, p. 257, 279, pl. 4, fig. 7.
1959 *Biscutum testudinarium* – Black *in* Black & Barnes, p. 325, pl. 10, fig. 1.
1967 *Biscutum constans* (Górka) Black *in* Black & Barnes – Black, p. 139–140.
1995 *Biscutum constans* (Górka) Black *in* Black & Barnes – Concheyro, p. 77, pl. 17, figs. 2, 12.
2006 *Biscutum constans* (Górka) Black *in* Black & Barnes – Bornemann & Mutterlose, p. 600–601, text. fig. 4.
2010 *Biscutum constans* (Górka) Black *in* Black & Barnes – Pérez Panera, p. 129–130, pl. 11, figs. 4–5; pl. 26, figs. 4–5.

Remarks. This species is difficult to identify because of its small size and similarities with other species of the genus *Biscutum*. In a study of the differences between *Biscutum constans* and *Biscutum ellipticum* of the Aptian–Albian of southeast France, Bornemann & Mutterlose (2006) concluded that the size decrease from *B. ellipticum* to *B. constans* was as a result of cooling and that as such they are not separate species. In the present contribution, both *B. ellipticum* and *B. constans* are maintained as different species because of the biostratigraphical value of *B. constans* in the Malvinas Plateau, close to the study area. Wise & Wind (1977) used the acme of *Biscutum constans* to define the *Biscutum constans* sub-zone, which is delimited by the LO datum of *Sollasites falklandensis* and the FO (first occurrence) of *Eiffellithus turriseiffelii* in the latest middle Albian.

Occurrence. Aptian–Coniacian (West well), Aptian–Campanian (North and East wells).

Biscutum coronum Wind & Wise *in* Wise & Wind, 1977

Figure 5.12

1977 *Biscutum coronum* – Wind & Wise *in* Wise & Wind, p. 297–298, pl. 24, figs. 10–12.
1995 *Biscutum coronum* Wind & Wise *in* Wise & Wind – Concheyro, p. 78.
2010 *Biscutum coronum* Wind & Wise *in* Wise & Wind – Pérez Panera, p. 130–131, pl. 11, figs. 6–8.

Remarks. This species is differentiated from others of the genus *Biscutum* by the presence of a bright ring surrounding the central-area when observed under crossed nicols. This

ring corresponds to the central tube cycle. Together with *Biscutum magnum,* this species is one of the largest species of the genus. Wise & Wind (1977) defined a zone for high latitude seas that correspond to the total range of *B. coronum*, which at that time was thought to be Campanian–Maastrichtian. Subsequent studies have demonstrated that *B. coronum* appears as early as the Turonian (Burnett, 1998). However, the zone proposed by Wise & Wind (1977) is regionally useful because in the Magallanes Basin *B. coronum* is an important constituent of the Campanian–Maastrichtian assemblages. In a subsequent study, Wise (1983) redefined the base of *Biscutum coronum* with the LO of *Marthasterites furcatus*. However, in the Magallanes Basin *M. furcatus* was not recognized yet, and therefore this event cannot be tested.

Occurrence. Coniacian (West well), Coniacian–Campanian (North and East wells).

Biscutum ellipticum (Górka, 1957) Grün *in* Grün & Allemann, 1975

1957 *Tremalithus ellipticus* – Górka, p. 269, pl. 1, fig. 11.
1975 *Biscutum ellipticum* (Górka) – Grün *in* Grün & Allemann, p. 154, pl. 1, figs. 5–7, text. fig. 3.
2010 *Biscutum ellipticum* (Górka) Grün *in* Grün & Allemann – Pérez Panera, p. 132, pl. 11, figs. 10–11.

Remarks. See *Bicutum constans* remarks.

Occurrence. Coniacian (West well), Coniacian–Campanian (North well).

Biscutum magnum Wind & Wise *in* Wise & Wind, 1977
Figure 5.13

1977 *Biscutum magnum* – Wind & Wise *in* Wise & Wind, p. 298, pl. 20, figs. 4–6; pl. 21, fig. 2; pl. 24, figs. 1–2; pl. 30, fig. 1; pl. 50, fig. 1.
1995 *Biscutum magnum* Wind & Wise *in* Wise & Wind – Concheyro, p. 78–79, pl. 17, figs. 1, 3–4.
2010 *Biscutum magnum* Wind & Wise *in* Wise & Wind – Pérez Panera, p. 133, pl. 11, fig. 12.

Remarks. This species is differentiated from other species of the genus *Biscutum* mainly because of its large size and wide empty central area. Wise (1983) proposed it as a marker species for the middle Maastrichtian of the Malvinas Plateau and its LO is a useful event for correlation of the early Maastrichtian also in the Magallanes Basin (Pérez Panera, 2012a).

Occurrence. Santonian (West well), Campanian (North and East wells).

Genus ***Seribiscutum*** Filewicz *et al. in* Wise & Wind, 1977

Type species. *Seribiscutum bijugum* Filewicz *et al. in* Wise & Wind, 1977. Aptian; Malvinas Plateau.

Seribiscutum gaultensis Mutterlose, 1992
Figure 5.14–15

1992 *Seribiscutum gaultensis* – Mutterlose, p. 360, pl. 1, figs. 1–6; pl. 6, fig. 4.
2000 *Biscutum gaultensis* (Mutterlose, 1992) – Bown *in* Kennedy *et al.*, p. 645–646, fig. 33i–j.
2010 *Seribiscutum gaultensis* Mutterlose – Pérez Panera, p. 138–139, pl. 12, figs. 2–4.

Remarks. The central area platelets in this species form a cross-like structure. For that reason, some authors argue this species should be within the genus *Biscutum.*

Occurrence. Albian (North well), Aptian–Abian (East well).

Seribiscutum primitivum (Thierstein, 1974) Filewicz *et al. in* Wind & Wise, 1983
Figure 5.16

1968 *Tremalithus* cf. *cretaceous* (Deflandre) – Forchheimer, p. 36, pl. 3, fig. 6a–b, text. fig. 3.
1974 *Cribrosphaerella primitiva* – Thierstein, p. 637, pl. 1, figs. 1–3.
1977 *Seribiscutum primitivum* (Thierstein) – Filewicz *et al. in* Wise & Wind, p. 311, pl. 66, figs. 4–6; pl. 67, figs. 1–4 (Invalid, ICBN Art. 33.2).
1983 *Seribiscutum primitivum* (Thierstein) – Filewicz *et al. in* Wind & Wise, p. 558.
2010 *Seribiscutum primitivum* (Thierstein) Filewicz *et al. in* Wind & Wise – Pérez Panera, p. 139–140, pl. 12, figs. 5–11; pl. 26, fig. 6.

Remarks. This species is similar to *Seribiscutum gaultensis* but is distinguished by its larger size and the "zig-zag" arrangement of the central-area platelets. Wise & Wind (1977) noticed that it occurs abundantly in the Albian assemblages of the Malvinas Plateau, and suggested that it could have cool surface water affinity. This species is also characteristic of the Campanian assemblages in the Magallanes Basin (Pérez Panera, 2012a). Its LO is useful for local correlation of the Campanian stage.

Occurrence. Coniacian (West well), Aptian–Campanian (North well), Albian–Campanian (East well).

Genus ***Sollasites*** Black, 1967

Type species. *Sollasites barringtonensis* Black, 1967. Oxfordian–Maastrichtian; cosmopolitan.

Sollasites falklandensis Filewicz *et al. in* Wise & Wind, 1977
Figure 5.17–18

1977 *Sollasites falklandensis* – Filewicz *et al. in* Wise & Wind, p. 311, pl. 50, figs. 6–7; pl. 64, figs. 2–4.
1983 *Sollasites falklandensis* Filewicz *et al. in* Wise & Wind – Wise, pl. 25, fig. 4; pl. 26, figs. 1–2.
2010 *Sollasites falklandensis* Filewicz *et al. in* Wise & Wind – Pérez Panera, p. 140–141, pl. 12, figs. 12–15; pl. 13, fig. 1.
2011 *Sollasites falklandensis* Filewicz *et al. in* Wise & Wind – Pérez Panera, p. 733, fig. 2 A–D.

Remarks. The LO of *Sollasites falklandensis* is a reliable event for the middle Albian in the Magallanes Basin and correlation with the Malvinas Plateau (Pérez Panera, 2010, 2011, 2012a).

Occurrence. Albian (West well).

Family PREDISCOSPHAERACEAE Rood, Hay & Barnard, 1971

Genus ***Prediscosphaera*** Vekshina, 1959

Type species. *Prediscosphaera decorata* Vekshina, 1959. Albian–Maastrichtian; cosmopolitan.

Prediscosphaera columnata (Stover, 1966)
Perch-Nielsen, 1984

1966 *Deflandrius columnata* – Stover, p. 141–142, pl. 6, figs. 6–10; pl. 9, fig. 16.
1971 *Prediscosphaera columnata* (Stover) – Manivit, p. 100, pl. 21, figs. 13–15 (Invalid).
1984 *Prediscosphaera columnata* (Stover) – Perch-Nielsen, p. 43.
2003 *Prediscosphaera columnata* (Stover) Perch-Nielsen – Herrle & Mutterlose, p. 19, pl. 8, fig. D.
2010 *Prediscosphaera columnata* (Stover) Perch-Nielsen – Pérez Panera, p. 143–144, pl. 13, fig. 7; pl. 25, fig. 3b.

Remarks. The FO of *Prediscosphaera columnata* is a zonal marker for the early Albian (Bown *et al.*, 1998). In the Magallanes Basin, this species is continuous and frequent in the Albian–Cenomanian successions (Pérez Panera, 2012a), useful for local correlation, and its FO for approximating the Aptian/Albian boundary.

Occurrence. Albian (West well), Albian–Cenomanian (North and East wells).

Prediscosphaera cretacea (Arkhangelsky, 1912)
Gartner, 1968

1912 *Coccolithophora cretacea* – Arkhangelsky, p. 410, pl. 6, figs. 12–13.
1952 *Coccolithus cretaceus* (Arkhangelsky) – Deflandre, p. 463, pl. 300, fig. D.
1954 *Rhabdolithus intercisus* – Deflandre *in* Deflandre & Fert, p. 159, pl. 13, figs. 12–13, text. figs. 91–92.
1957 *Discolithus cretaceous* (Arkhangelsky) – Górka, p. 251, pl. 2, fig. 11.
1964 *Deflandrius cretaceous* (Arkhangelsky) – Bramlette & Martini, p. 301, pl. 2, figs. 11–12.
1964 *Deflandrius intercisus* (Deflandre) – Bramlette & Martini, p. 301, pl. 2, figs. 13–16.
1968 *Prediscosphaera cretacea* (Arkhangelsky) – Gartner, p. 19–20, pl. 2, figs. 10–14; pl. 3, fig. 8; pl 4, figs. 19–24; pl. 6, figs. 14–15; pl. 9, figs. 1–4; pl. 12, fig. 1; pl. 14, figs. 20–22; pl. 18, fig. 8; pl. 22, figs. 1–3; pl. 23, figs. 4–6; pl. 25, figs. 12–14; pl. 26, fig. 2.
1995 *Prediscosphaera cretacea* (Arkhangelsky) Gartner – Concheyro, p. 85–86, pl. 8, fig. 10; pl. 12, fig. 8; pl. 13, fig. 4, pl. 17, fig. 23.
2010 *Prediscosphaera cretacea* (Arkhangelsky) Gartner – Pérez Panera, p. 144–145, pl. 13, figs. 8–9.

Remarks. This species is similar to *Prediscosphaera columnata* but differs in its more elliptical outline, in such a way that it is possible to notice the disposition of the central cross at 45° to the main axis of the ellipse. *Prediscosphaera cretacea* also shows a meagre birefringence in the outer shield and the structure of the spine between *P. cretacea* and *P. columnata* differs in side view. According to Crux (1991), both species are so similar that he grouped them as *Prediscosphaera cretacea,* stating that it is only possible to differentiate them when the spine is observed in side view.

Occurrence. Cenomanian–Campanian (West and North wells).

Prediscosphaera majungae Perch-Nielsen, 1973

1973 *Prediscosphaera majungae* – Perch-Nielsen, p. 321, pl. 8, figs. 1–6; pl. 10, figs. 37–38.

Occurrence. Campanian (North well).

Prediscosphaera spinosa (Bramlette & Martini,1964) Gartner, 1968

Figure 5.19

1964 *Deflandrius spinosus* – Bramlette & Martini, p. 301, pl. 2, figs. 17–20.
1965 *Eiffellithus cretaceous cretaceous* – Reinhardt, p. 35, pl. 2, fig. 4; text. fig. 3.
1968 *Prediscosphaera spinosa* (Bramlette & Martini) – Gartner, p. 20–21, pl. 1, figs. 15–16; pl. 3, figs. 9–10; pl. 5, figs. 7–9; pl. 6, fig. 16; pl. 11, fig. 17.
1995 *Prediscosphaera spinosa* (Bramlette & Martini) Gartner – Concheyro, p. 86, pl. 16, figs. 9–10.
2010 *Prediscosphaera spinosa* (Bramlette & Martini) Gartner – Pérez Panera, p. 150–151.

Occurrence. Aptian–Campanian (West well), Cenomanian (North well), Albian (East well).

Prediscosphaera stoveri (Perch-Nielsen, 1968) Shafik & Stradner, 1971

1968 *Deflandrius stoveri* – Perch-Nielsen, p. 66, pl. 16, figs. 11–13.
1969 *Prediscosphaera germanica* – Bukry, p. 39, pl. 18, figs. 1–3.
1971 *Prediscosphaera stoveri* (Perch-Nielsen) – Shafik & Stradner, p. 126, pl. 22, fig. 1.
2010 *Prediscosphaera stoveri* (Perch-Nielsen) Shafik & Stradner – Pérez Panera, p. 149–150.

Remarks. This is a small species with a sub-elliptical outline and it is frequently found without the central cross, probably as a result of dissolution. Watkins *et al.* (1996) stated that within austral oceans this species shows an acme event in the late Maastrichtian, which correlates to the base of the Zone CC26 of Sissingh (1977). This event has been recorded in the Colorado Basin (Pérez Panera & Angelozzi, 2006) and the Austral Basin (Pérez Panera, 2012a; González Estebenet *et al.*, 2020), and it is an important regional event for the earliest late Maastrichtian.

Occurrence. Coniacian–Campanian (West, North and East wells).

Family CRETARHABDACEAE Thierstein, 1973

Genus ***Cretarhabdus*** Bramlette & Martini, 1964 *emend.* Bukry, 1969

Type species. *Cretarhabdus conicus* Bramlette & Martini, 1964. Kimmeridgian–Maastrichtian; cosmopolitan.

Cretarhabdus striatus (Stradner, 1963) Black, 1973

1963 *Arkhangelskiella striata* – Stradner, p. 176, pl. 1, fig. 1.
1973 *Cretarhabdus striatus* (Stradner) – Black, p. 53, pl. 17, figs. 3–6, 10–11.
2010 *Cretarhabdus striatus* (Stradner) Black – Pérez Panera, p. 152–153, pl. 13, figs. 14–15; pl. 14, figs. 1–2.

Occurrence. Aptian (West well), Albian (North well).

Genus ***Grantarhabdus*** Black, 1971

Type species. *Grantarhabdus meddii* Black, 1971. Tithonian–Albian; cosmopolitan.

Grantarhabdus coronadventis (Reinhardt, 1966a) Grün *in* Grün & Allemann, 1975

Figure 5.20

1966a *Cretarhabdus coronadventis* – Reinhardt, p. 26, pl. 23, figs. 29–30.
1966 *Cretarhabdus unicornis* – Stover, p. 140, pl. 5, figs. 15–16; pl. 9, fig. 15.
1975 *Grantarhabdus coronadventis* (Reinhardt) – Grün *in* Grün & Allemann, p. 184.
1985 *Gephyrorhabdus coronadventis* (Reinhardt) – Perch-Nielsen, p. 385, pl. 51, figs. 3, 20.
2010 *Grantarhabdus coronadventis* (Reinhardt) Grün *in* Grün & Allemann – Pérez Panera, p. 153–154, pl. 14, figs. 3–6; pl. 27, figs. 5–6.

Remarks. This species differs from *Grantarhabdus meddii* in its larger size and broader crossbars. Under polarized light, the crossbars display a median extinction line.

Occurrence. Albian (West well).

Genus ***Retecapsa*** Black, 1971

Type species. *Retecapsa brightoni* Black, 1971. Berriasian–Maastrichtian; cosmopolitan.

Retecapsa crenulata (Bramlette & Martini, 1964) Grün *in* Grün & Allemann, 1975

1964 *Cretarhabdus crenulata* – Bramlette & Martini, p. 300, pl. 2, figs. 21–24.
1975 *Retecapsa crenulata* (Bramlette & Martini) – Grün *in* Grün & Allemann, p. 175, pl. 4, figs. 4–6; text. fig. 18.
2010 *Retecapsa crenulata* (Bramlette & Martini) Grün *in* Grün & Allemann – Pérez Panera, p. 157, pl. 14, fig. 12.

Occurrence. Coniacian (West well), Cenomanian–Campanian (North well).

Retecapsa ficula (Stover, 1966) Burnett, 1997

1966 *Coccolithes ficula* – Stover, p. 138, pl. 5, figs. 5–6; pl. 9, fig. 11.
1997 *Retecapsa ficula* (Stover) – Burnett, p. 138.
2010 *Retecapsa ficula* (Stover) Burnett – Pérez Panera, p. 157–158, pl. 14, figs. 13–14.

Occurrence. Santonian (West well), Albian–Campanian (North well), Albian (East well).

Retecapsa surirella (Deflandre & Fert, 1954)
Grün *in* Grün & Allemann, 1975

1954 *Discolithus surirella* – Deflandre & Fert, p. 144, text. figs. 30–31.
1970 *Cretarhabdus surirellus* (Deflandre & Fert) – Reinhardt, p. 50, pl. 1, figs. 6–8; pl. 2, figs. 1–6 ; text. fig. 22.
1975 *Retecapsa surirella* (Deflandre & Fert) – Grün *in* Grün & Allemann, p. 176–177.
2010 *Retecapsa surirella* (Deflandre & Fert) Grün *in* Grün & Allemann – Pérez Panera, p. 158–159, pl. 14, fig. 15; pl. 15, fig. 1.

Occurrence. Albian–Coniacian (West well), Coniacian–Campanian (East well).

Family TUBODISCACEAE Bown & Rutledge
in Bown & Young, 1997

Genus ***Manivitella*** Thierstein, 1971 *emend*. Black, 1973

Type species. *Circolithus pemmatoideus* Deflandre *in* Manivit, 1965. Tithonian–Maastrichtian; cosmopolitan.

Manivitella pemmatoidea (Deflandre *in* Manivit, 1965)
Thierstein, 1971

1965 *Circolithus pemmatoideus* – Deflandre *in* Manivit, p. 192, pl. 2, fig. 8.
1966 *Cyclococcolithus gronosus* – Stover, p. 140, pl. 1, figs. 1–3; pl. 8, fig. 1.
1969 *Apertapetra gronosa* (Stover) – Bukry, p. 26, pl. 6, figs. 6–9.
1971 *Manivitella pemmatoidea* (Deflandre *in* Manivit) – Thierstein, p. 480, pl. 5, figs. 1–3.
2010 *Manivitella pemmatoidea* (Deflandre *in* Manivit) Thierstein – Pérez Panera, p. 161–162, pl. 15, figs. 8–12; pl. 27, figs. 7–8.

Occurrence. Albian (North well).

Order WATZNAUERIALES Bown, 1987
Family WATZNAUERIACEAE Rood, Hay & Barnard, 1971

Genus ***Watznaueria*** Reinhardt, 1964

Type species. *Watznaueria angustoralis* Reinhardt, 1964. Bathonian–Maastrichtian; cosmopolitan.

Watznaueria barnesae (Black *in* Black & Barnes, 1959)
Perch-Nielsen, 1968
Figure 6.1

1959 *Tremalithus barnesae* – Black *in* Black & Barnes, p. 325, pl. 9, figs. 1–2.
1964 *Tergestiella barnesae* (Black) – Reinhardt, p. 753.
1968 *Coccolithus barnesae* (Black) – Gartner, p. 17, pl. 1, fig. 12; pl. 4, figs. 6–7; pl. 8, figs. 18–22; pl. 11, fig. 11; pl. 14, figs. 4–5; pl. 15, fig. 8; pl. 16, figs. 15–16; pl. 19, fig. 12; pl. 20, figs. 12–13; pl. 22, figs. 16–17; pl. 24, fig. 8; pl. 25, figs. 1–2.
1968 *Watznaueria barnesae* (Black *in* Black & Barnes) – Perch-Nielsen, p. 68–69, pl. 22, figs. 1–7; pl. 23, figs. 1, 4–6; text. fig. 32.

Occurrence. Valanginian–Campanian (West and North wells), Aptian–Campanian (East well).

Watznaueria biporta Bukry, 1969
Figure 6.2

1969 *Watznaueria biporta* – Bukry, p. 32, pl. 10, figs. 8–10.
1970 *Coccolithus bornholmensis* – Forchheimer, p. 12, text. figs. 5–7, 12.
1971 *Watznaueria cynthae* – Worsley, p. 1314, pl. 2, figs. 23–25.

Occurrence. Valanginian–Coniacian (West well), Valanginian–Cenomanian (North well), Aptian–Campanian (East well).

Watznaueria britannica (Stradner, 1963) Reinhardt, 1964
Figure 6.3

1963 *Coccolithus britannicus* – Stradner, p. 10, pl. 1, fig. 7a.
1964 *Watznaueria britannica* (Stradner) – Reinhardt, p. 753, pl. 2, fig. 3; text. fig. 5.
1968 *Ellipsagelosphaera britannica* (Stradner) – Perch-Nielsen, p. 71.

Occurrence. Valanginian–Aptian (West well), Valanginian–Albian (North well), Aptian–Albian (East well).

Watznaueria fossacincta (Black, 1971)
Bown *in* Bown & Cooper, 1989
Figure 6.4

1971 *Ellipsagelosphaera fossacincta* – Black, p. 399, pl. 30, fig. 8.
1975 *Ellipsagelosphaera keftalrempti* – Grün *in* Grün & Allemann, p. 161–162, pl. 2, figs. 5–6; text. fig. 7.
1980 *Ellipsagelosphaera fossacincta* Black – Grün & Zweili, p. 253–254, pl. 2, figs. 4–5; text. fig. 11.
1989 *Watznaueria fossacincta* (Black) – Bown *in* Bown & Cooper, p. 96, pl. 1, figs. 34, 40–41.

Occurrence. Valanginian–Coniacian (West well), Valanginian–Campanian (North well), Aptian–Albian (East well).

Watznaueria ovata Bukry, 1969

1969 *Watznaueria ovata* – Bukry, p. 33, pl. 11, figs. 11–12.
1973 *Ellipsagelosphaera ovata* (Bukry) – Black, p. 71, pl. 26, figs. 10–12.

Occurrence. Aptian–Albian (North well).

Genus ***Cyclagelosphaera*** Noël, 1965b

Type species. *Cyclagelosphaera margereli* Noël, 1965b. Bajocian–Paleocene; cosmopolitan.

Cyclagelosphaera alta Perch-Nielsen, 1979

1979 *Cyclagelosphaera alta* – Perch-Nielsen, p. 130, pl. 3, figs. 2–4, 7.

Occurrence. Maastrichtian (West well).

Cyclagelosphaera margerelii Noël, 1965b

1965b *Cyclagelosphaera margereli* – Noël, p. 130, pl. 17, figs. 4–9; pl. 18, figs. 1–2; pl. 20, figs. 2–4; text. figs. 44–46.

Occurrence. Campanian–Maastrichtian (West well), Hauterivian–Campanian (North well).

Cyclagelosphaera reinhardtii (Perch-Nielsen, 1968)
Romein, 1977

1968 *Markalius reinhardtii* – Perch-Nielsen, p. 76, pl. 23, figs. 6–8; text. fig. 38.
1977 *Cyclagelosphaera reinhardtii* (Perch-Nielsen) – Romein, p. 274, pl. 2, figs. 2a–b.

Occurrence. Coniacian (West well), Aptian–Campanian (North well), Albian–Cenomanian (East well).

Order ARKHANGELSKIALES Bown & Hampton
in Bown & Young, 1997
Family ARKHANGELSKIELLACEAE Bukry, 1969 *emend.*
Bown & Hampton *in* Bown & Young, 1997

Genus ***Arkhangelskiella*** Vekshina, 1959
emend. Hoffmann, 1970b

Type species. *Arkhangelskiella cymbiformis* Vekshina, 1959. Campanian–Maastrichtian; cosmopolitan.

Arkhangelskiella confusa Burnett, 1997
Figure 6.5

1989 *Arkhangelskiella cymbiformis* var. N – Varol, p. 132, pl. 1, figs. 5–8.
1997 *Arkhangelskiella confusus* – Burnett, p. 133.
1998 *Arkhangelskiella confusa* Burnett – Burnett, p. 182, pl. 6.8, figs. 6–7.
2010 *Arkhangelskiella confusa* Burnett – Pérez Panera, p. 175, pl. 19, figs. 1–2.

Occurrence. Coniacian (West well), Cenomanian–Campanian (North well), Coniacian–Campanian (East well).

Arkhangelskiella cymbiformis Vekshina, 1959
Figure 6.6

1912 "Coccolith of unknown affinities" – Arkhangelsky, pl. 6, fig. 24.
1959 *Arkhangelskiella cymbiformis* – Vekshina, p. 66, pl. 2, fig. 3a–b.
1959 *Arkhangelskiella specillata* – Vekshina, p. 67, pl. 2, fig. 5.
1978 *Broinsonia lata* (Nöel) – Gazdzicka, p. 352–353, pl. 232, figs. 1, 3.
1978 *Broinsonia cribata* – Gazdzicka, p. 353, pl. 33, figs. 1–6.
1983 *Arkhangelskiella cribata* (Gazdzicka) – Wise, p. 506.
1995 *Arkhangelskiella specillata* Vekshina – Concheyro, p. 72, pl. 3, fig. 13.

Occurrence. Campanian–Maastrichtian (West well).

Genus ***Broinsonia*** Bukry, 1969

Type species. *Broinsonia dentata* Bukry, 1969. Campanian; cosmopolitan.

Broinsonia matalosa (Stover, 1966) Burnett *in* Gale *et al.*, 1996
Figure 6.7–8

1966 *Coccolithus matalosa* – Stover, p. 139, pl. 2, figs. 1–2; pl. 8, fig. 10.
1969 *Staurolithites matalosus* (Stover) – Čepek & Hay, p. 325.
1973 *Vagalapilla matalosa* (Stover) – Thierstein, p. 37–38, pl. 3, figs. 15–18.
1996 *Broinsonia matalosa* (Stover) – Burnett *in* Gale *et al.*, p. 604, pl. 4, figs. e–h.
2010 *Broinsonia matalosa* (Stover) Burnett *in* Gale *et al.* – Pérez Panera, p. 180–181, pl. 19, figs. 3–5.

Occurrence. Valanginian–Albian (West well), Valanginian–Cenomanian (North well), Aptian–Cenomanian (East well).

Broinsonia signata (Noël, 1969) Noël, 1970

Figure 6.9

1969 *Aspidolithus signatus* – Noël, p. 197, pl. 2, figs. 3–4.
1970 *Broinsonia signata* (Noël) – Noël, p. 78, pl. 25, figs. 4–6.
1995 *Aspidolithus signatus* Noël – Concheyro, p. 71.
2010 *Broinsonia signata* (Noël) Noël – Pérez Panera, p. 184, pl. 19, figs. 10–13.

Occurrence. Albian–Campanian (West and North wells), Cenomanian–Campanian (East well).

Genus ***Thiersteinia*** Wise & Watkins *in* Wise, 1983

Type species. *Thiersteinia ecclesiastica* Wise & Watkins *in* Wise, 1983. Turonian–Coniacian; South Atlantic and India Ocean.

Thiersteinia ecclesiastica Wise & Watkins *in* Wise, 1983

Figure 6.10

1983 *Thiersteinia ecclesiastica* – Wise & Watkins *in* Wise, p. 509, pl. 14, figs. 1–4; pl. 15, figs. 1–8; pl. 16, figs. 1–9; pl. 17, figs. 1–4.
2010 *Thiersteinia ecclesiastica* Wise & Watkins *in* Wise – Pérez Panera, p. 185–186, pl 20, figs. 1–2.

Remarks. This is an austral species, only recorded in the South Atlantic and western Indian Ocean (Burnett, 1998). Wise (1983) proposed the LO of *T. ecclesiastica* as a marker for approximating the Coniacian/Santonian boundary in the Malvinas Plateau. In the Magallanes Basin, this species is not always present. When it is present, is a rare component of the assemblages, but is very useful for biostratigraphy.

Occurrence. Coniacian (West well).

Family KAMPTNERIACEAE Bown & Hampton *in* Bown & Young, 1997

Genus ***Gartnerago*** Bukry, 1969

Type species. *Arkhangelskiella concava* Gartner, 1968. Cenomanian–Maastrichtian; cosmopolitan.

Gartnerago segmentatum (Stover, 1966) Thierstein, 1974

Figure 6.11

1966 *Discolithus segmentatus* – Stover, p. 143, pl. 3, figs. 3–6; pl. 8, fig. 19.
1967 *Arkhangelskiella obliqua* Stradner – Reinhardt, p. 174.
1968 *Arkhangelsiella concava* – Gartner, p. 37, pl. 14, figs. 2–3; pl. 16, figs. 5–7; pl. 17, fig. 7; pl. 18, figs. 22–23; pl. 19, fig. 6; pl. 21, fig. 7; pl. 22, figs. 13–15.
1969 *Gartnerago concavum* (Gartner) – Bukry, p. 24, pl. 4, figs. 2–6.
1970 *Gartnerago obliquum* (Reinhardt) – Noël, p. 79, pl. 26, figs. 1–7.
1972 *Gartnerago concavum* (Gartner) Bukry – Forchheimer, p. 26, pl. 3, fig. 5.
1974 *Gartnerago segmentatum* (Stover) – Thierstein, p. 640, pl. 5, figs. 1–2; pl. 6, figs. 1, 3–10; pl. 7, fig. 6.
1977 *Gartnerago segmentatum* (Stover) Thierstein – Wise & Wind, p. 300, pl. 52, figs. 2–3.

Occurrence. Coniacian–Campanian (West well), Albian–Campanian (North and East wells).

Gartnerago stenostaurion (Hill, 1976) Perch-Nielsen, 1984

Figure 6.12

1976 *Broinsonia*? *stenostaurion* – Hill, p. 127–128, pl. 3, figs. 13–24.
1984 *Gartnerago stenostaurion* (Hill) – Perch-Nielsen, p. 43.
1996 *Arkhangelskiella*? sp. – Burnett *in* Gale *et al.*, pl. 4, fig. D.
1997 *Arkhangelskiella antecessor* – Burnett, p. 133.
2000 *Broinsonia*? *stenostaurion* – Bown *in* Kennedy *et al.*, pl. 34, figs. u–y.
2003 *Arkhangelskiella stenostaurion* (Hill, 1976) – Herrle & Mutterlose, p. 18, pl. 6, figs. A–C.
2005 *Gartnerago stenostaurion* (Hill) Perch-Nielsen – Bown, p. 34, pl. 10, figs. 29–36.
2010 *Arkhangelskiella stenostaurion* (Hill, 1976) Herrle & Mutterlose – Pérez Panera, p. 178–179, pl. 18, figs. 6–15.
2012a *Arkhangelskiella stenostaurion* (Hill, 1976) Herrle & Mutterlose – Pérez Panera, pl. 11, fig. 16

Occurrence. Aptian–Albian (North well), Aptian (East well).

Gartnerago theta (Black *in* Black & Barnes, 1959) Jakubowski, 1986

1959 *Discolithus theta* – Black *in* Black & Barnes, p. 327, pl. 12, fig. 1.
1969 *Zygodiscus theta* (Black *in* Black & Barnes) – Bukry, p. 62, pl. 36, figs. 7–8.
1986 *Gartnerago theta* (Black *in* Black & Barnes) – Jakubowski, p. 39, pl. 1, figs. 14–15.

Occurrence. Coniacian (West well), Albian–Cenomanian (North well).

Order INCERTAE SEDIS

Genus ***Repagulum*** Forchheimer, 1972

Type species. *Discolithus parvidentatus* Deflandre & Fert, 1954. Valanginian–Maastrichtian; cosmopolitan.

Repagulum parvidentatum (Deflandre & Fert, 1954) Forchheimer, 1972

1954 *Discolithus parvidentatus* – Deflandre & Fert, p. 143–144, text. figs. 28–29.
1969 *Watznaueria parvidentata* (Deflandre & Fert) – Bukry, p. 33, pl. 12, figs. 5–8.
1972 *Repagulum parvidentatum* (Deflandre & Fert) – Forchheimer, p. 38–39, pl. 12, figs. 1–7.
1976 *Dictyococcites parvidentata* (Deflandre & Fert) – Burns, p. 285–286.

Occurrence. Aptian–Coniacian (West well), Albian–Campanian (North well), Albian (East well).

HOLOCOCCOLITHS

Order INCERTAE SEDIS

Family CALYPTROSPHAERACEAE Boudreaux & Hay, 1969

Genus ***Calculites*** Prins & Sissingh *in* Sissingh, 1977

Type species. *Tetralithus obscurus* Deflandre, 1959. Turonian–Maastrichtian; cosmopolitan.

Calculites obscurus (Deflandre, 1959) Prins & Sissingh *in* Sissingh, 1977

1959 *Tetralithus obscurus* – Deflandre, p.138, text. figs. 26–29.
1973 *Tetralithus ovalis* Stradner – Risatti, p. 32, pl. 5, figs. 3–4.
1977 *Calculites obscurus* (Deflandre) – Prins & Sissingh *in* Sissingh, p. 60.
1977 *Phanulithus obscurus* (Deflandre) – Wind & Wise *in* Wise & Wind, p. 304, pl. 31, fig. 5; pl. 33, figs. 2–6; pl. 34, figs. 2, 4; pl. 36, fig. 6.

Occurrence. Coniacian–Campanian (West well), Cenomanian–Campanian (North and East wells).

Genus ***Lucianorhabdus*** Deflandre, 1959

Type species. *Lucianorhabdus cayeuxii* Deflandre, 1959. Coniacian–Maastrichtian; cosmopolitan.

Lucianorhabdus maleformis Reinhardt, 1966a

Figure 6.13

1966a *Lucianorhabdus maleformis* – Reinhardt, p. 42, pl. 21, figs. 5, 7.

Occurrence. Cenomanian–Campanian (North well).

NANOLITHS

Order INCERTAE SEDIS

Family BRAARUDOSPHAERACEAE Deflandre, 1947

Genus ***Braarudosphaera*** Deflandre, 1947

Type species. *Pontosphaera bigelowii* Gran & Braarud, 1935. Cenomanian–Extant; cosmopolitan.

Braarudosphaera bigelowii (Gran & Braarud, 1935) Deflandre, 1947

1935 *Pontosphaera bigelowi* – Gran & Braarud, p. 389, text. fig. 67.
1947 *Braarudosphaera bigelowii* (Gran & Braarud) – Deflandre, p. 439, text. figs. 1–5.

Occurrence. Cenomanian (North well).

Family MICRORHABDULACEAE Deflandre, 1953

Genus ***Lithraphidites*** Deflandre, 1963

Type species. *Lithraphidites carniolensis* Deflandre, 1963. Berriasian–Maastrichtian; cosmopolitan.

Lithraphidites bollii (Thierstein, 1971) Thierstein, 1973

Figure 6.14–16

1971 *Microrhabdulus bollii* – Thierstein, p. 481, pl. 3, figs. 6–10.
1973 *Lithraphidites bollii* (Thierstein) – Thierstein, p. 45.

Remarks. *Lithraphidites bollii* is a good marker for the

Hauterivian (*i.e.*, Thierstein, 1971; Bergen, 1994; Bown *et al.*, 1998). In the Magallanes Basin assemblages, its presence is sporadic but biostratigraphically useful.

Occurrence. Hauterivian (North well).

Family POLYCYCLOLITHACEAE Forchheimer, 1972
emend. Varol, 1992

Genus ***Eprolithus*** Stover, 1966

Type species. *Lithastrinus floralis* Stradner, 1962. Aptian–Campanian; cosmopolitan.

Eprolithus floralis (Stradner, 1962) Stover, 1966
Figure 6.17–18

1962 *Lithastrinus floralis* – Stradner, p. 370–372, pl. 2, figs. 7–11.
1966 *Eprolithus floralis* (Stradner) – Stover, p. 149, pl. 7, figs. 4–7; pl. 9, fig. 21.
1992 *Eprolithus floralis* (Stradner) Stover – Varol, p. 103, pl. 1, figs. 11–12; pl. 6, fig. 16.
2010 *Eprolithus floralis* (Stradner) Stover – Pérez Panera, p. 213–214, pl. 23, figs. 1–10.

Remarks. The LO of this species is a marker for the early Campanian (Burnett, 1998). According to Wise (1983), in the Malvinas Plateau this event occurs in the middle Santonian. In the Magallanes Basin, *E. floralis* occurs sporadically, so its LO event is not reliable. Sometimes it is recorded below the LO of *Thiersteinia ecclesiastica,* in the Coniacian, sometimes in the early Campanian (Pérez Panera, 2010, 2012a).

Occurrence. Albian–Coniacian (West well), Albian–Cenomanian (North well), Albian–Campanian (East well).

Eprolithus moratus (Stover, 1966) Burnett, 1998
Figure 6.19

1966 *Lithastrinus moratus* – Stover, p. 149, pl. 7, fig. 20.
1992 *Lithastrinus eptapetalus* – Varol, pl. 1, figs. 2–4; pl. 6, figs. 8–13.
1998 *Eprolithus moratus* (Stover) – Burnett, p. 192, pl. 6.13, figs. 5–6.

Remarks. The FO of this species is a marker for the early Turonian (Burnett, 1998). In the Magallanes Basin, this species is very rare, so it is not useful for biostratigraphy.

Occurrence. Coniacian–Santonian (North well).

Eprolithus octopetalus Varol, 1992
Figure 6.20

1992 *Eprolithus octopetalus* – Varol, pl. 1, figs. 5–10; pl. 6, figs. 14–15.
1993 *Lithastrinus octuplus* – Gartner *in* Robaszynski *et al.*, pl. 24, fig. 12a–b.

Remarks. This species is a good marker for the Cenomanian–Turonian (Burnett, 1998; Linnert *et al.*, 2010).

Occurrence. Cenomanian (North well).

Genus ***Micula*** Vekshina, 1959

Type species. *Micula decussata* Vekshina, 1959. Coniacian–Maastrichtian; cosmopolitan.

Micula adumbrata Burnett, 1997
Figure 7.1

1997 *Micula adumbrata* – Burnett, p. 137, pl. 1, fig. 23a–d.

Remarks. This is the first record of this species in the Magallanes Basin. According to Burnett (1998), its FO is a good marker for the Turonian/Coniacian boundary. However, Pérez Panera *et al.* (2019) reported the FO of *M. adumbrata* in the early Turonian of La Luna Formation, in northeastern Colombia. So, this event might not be useful for global correlation and should be correlated with other events until applying it in the Magallanes Basin.

Occurrence. Coniacian (West well).

Micula concava (Stradner *in* Martini & Stradner, 1960) Verbeek, 1976
Figure 7.2

1960 *Nannotetraster concavus* – Stradner *in* Martini & Stradner, p. 269, text. fig. 18.
1976 *Micula concava* (Stradner *in* Martini & Stradner) – Verbeek, p. 147, pl. 2, fig. 3.

Occurrence. Campanian–Maastrichtian (West well), Campanian (North well).

Micula staurophora (Gardet, 1955) Stradner, 1963
Figure 7.3–4

1955 *Discoaster staurophorus* – Gardet, p. 534, pl. 10, fig. 96.
1959 *Micula decussata* – Vekshina, p. 71, pl. 1, fig. 6; pl. 2, fig. 11.

1959 *Trochoaster staurophorus* (Gardet) – Stradner, p. 480, text. figs. 49–50.
1960 *Nannotetraster staurophorus* (Gardet) – Martini & Stradner, p. 266, text. fig. 1.
1963 *Micula staurophora* (Gardet) – Stradner, p. 8, pl. 4, fig. 12.

Remarks. *Micula staurophora* and in less abundance *M. concava,* exhibit an acme along the Argentinean offshore basins in the latest Maastrichtian, being more important in the Colorado Basin (Pérez Panera & Angelozzi, 2006; Keller *et al.*, 2007; Pérez Panera *et al.,* 2018; Pérez Panera, 2019; González Estebenet *et al.*, 2020). This acme has been also observed in the Walvis Ridge (*i.e.*, Thibault *et al.*, 2010) and is a reliable event for local and intra-basinal correlation. However, in the Magallanes Basin, the late Maastrichtian is missing in most places.

Occurrence. Coniacian–Maastrichtian (West well), Coniacian–Campanian (North well).

Micula swastica Stradner & Steinmetz, 1984
Figure 7.5

1984 *Micula swastica* – Stradner & Steinmetz, p. 595, pl. 31, figs. 3, 5–6.

Occurrence. Coniacian–Campanian (North well).

Genus ***Quadrum*** Prins & Perch-Nielsen *in* Manivit *et al.*, 1977

Type species. *Quadrum gartneri* Prins & Perch-Nielsen *in* Manivit *et al.*, 1977. Turonian–Maastrichtian; cosmopolitan.

Quadrum gartneri Prins & Perch-Nielsen *in* Manivit *et al.*, 1977
Figure 7.6

1974 "*Micula pyramida*" Gardet – Thierstein, p. 12, figs. 4–8.
1977 *Quadrum gartneri* – Prins & Perch-Nielsen *in* Manivit *et al.*, p. 177–178.

Occurrence. Coniacian–Maastrichtian (West well).

Genus ***Uniplanarius*** Hattner & Wise, 1980

Type species. *Tetralithus gothicus* Deflandre, 1959. Santonian–Maastrichtian; cosmopolitan.

Uniplanarius gothicus (Deflandre, 1959) Hattner & Wise *in* Wind & Wise 1983
Figure 7.7

1959 *Tetralithus gothicus* – Deflandre, p. 138, pl. 3, fig. 25.
1977 *Quadrum gothicum* (Deflandre, 1959) – Prins & Perch-Nielsen *in* Manivit *et al.*, p. 178.
1980 *Uniplanarius gothicus* (Deflandre) – Hattner & Wise, p. 6, pl. 32, fig. 4; pl. 42, figs. 4–5 (Invalid ICBN Art. 33.2).
1983 *Uniplanarius gothicus* (Deflandre) – Hattner & Wise *in* Wind & Wise, p. 558.
2010 *Quadrum gothicum* (Deflandre, 1959) Prins & Perch-Nielsen *in* Manivit *et al.* – Pérez Panera, p. 221.

Occurrence. Santonian–Campanian (North well).

Genus ***Radiolithus*** Stover, 1966

Type species. *Radiolithus planus* Stover, 1966. Aptian–Turonian; cosmopolitan.

Radiolithus planus Stover, 1966
Figure 7.8

1966 *Radiolithus planus* – Stover, p. 60, pl. 7, figs. 22, 24; pl. 9, fig. 23.

Occurrence. Albian–Cenomanian (North well), Aptian–Albian (East well).

Genus ***Hayesites*** Manivit, 1971

Type species. *Hayesites albiensis* Manivit, 1971. Albian; cosmopolitan.

Hayesites sp.

Occurrence. Coniacian (West well).

Division PYRROPHYTA Pascher, 1914
Class DINOPHYCEAE Fritsch, 1929
Order THORACOSPHAERALES Tangen *in* Tangen *et al.*, 1982
Family THORACOSPHAERACEAE Schiller, 1930 *emend.* Tangen *in* Tangen *et al.*, 1982

Genus ***Cervisiella*** Hildebrand-Habel *et al.*, 1999

Type species. *Cervisiella saxea* (Stradner, 1961) Hildebrand-Habel *et al.*, 1999. Maastrichtian–Miocene; cosmopolitan.

Cervisiella spp.

Occurrence. Campanian–Maastrichtian (West well), Campanian (North well).

DISCUSSION

The succession of Cretaceous sediments penetrated by the three wells represents marine facies from the Maastrichtian down to the Valanginian. Table 1 summarizes the assemblages, subsurface formations (after Flores *et al.*, 1973), and main biomarkers of the three wells, obtained by the two studied disciplines.

The Valanginian–Hauterivian assemblage is characterized by a very low diversity of microfossils, including foraminiferal species typical of this age in the basin, like *Lenticulina nodosa*, *Astacolus gibber*, and *Polymorphina martinezi*, which allows a correlation to the Pampa Rincón Formation (Flores *et al.*, 1973; Malumián & Masiuk, 1975). *Polymorphina martinezi* usually points to deposits a little older than those containing the other two (Malumián & Masiuk, 1975), but in the three wells studied here, they all occur together. The occurrence of *Epistomina caracolla* in the West and North wells indicates that the age of the uppermost strata in this section is slightly younger (late Hauterivian) than the classic "Zone of *Lenticulina nodosa-Astacolus gibber*" (late Valanginian–early Hauterivian), established by Malumián & Masiuk (1975) (see also Malumián & Náñez, 1983). The age given by these foraminifers is confirmed by the rare presence of the calcareous nannofossils *Lithraphidites bollii* and *Eiffellithus striatus*, which are recorded for the first time in the Magallanes Basin (Tab. 1).

An unconformity, evidenced by the absence of Barremian strata, marks a very distinct faunal turnover. The predominance of radiolarians, as originally described for the Nueva Argentina Formation, is typical of the Aptian in the Magallanes Basin (Flores *et al.*, 1973; Malumián & Masiuk, 1976a). Calcareous nannofossils are scarce in this part, as observed by Pérez Panera (2012a) in the eastern part of the Magallanes Basin. The transition between the Aptian and the Albian is difficult to determine and usually estimated by a sudden increase in foraminiferal species richness and abundance in contrast to the previously predominant radiolarians. The Albian is dominated by planktic foraminifera like *Muricohedbergella portsdownensis, M. planispira,* and *M. delrioensis* (Malumián & Masiuk, 1978) (Tab. 1). These occur together with endemic benthic forms of the Magallanes Basin such as *Dorothia mordojovichi*, *Tritaxia gaultina australis*, *Lingulogavelinella magallanica,* and other cosmopolitan species such as *Marssonella oxycona*, *Orithostella indica*, and *Osangularia utaturensis*. This assemblage is typical of the Arroyo Alfa Formation, proposed by Flores *et al.* (1973) (see also Malumián & Masiuk, 1976a). Typical index species among the calcareous nannofossils of this time are *Sollasites falklandensis* and *Gartnerago stenostaurion* (Pérez Panera, 2011, 2012a) (Tab. 1).

The assemblage broadly continues into the Cenomanian in the North and East wells, which can be distinguished

TABLE 1 - Subsurface formations, foraminiferal and nannofossil assemblages and markers.

Formation	Assemblage	Micro markers	Nanno markers
Cabeza de León	Maastrichtian	Agglutinated foraminifera	Low diversity of K taxa
	Campanian–Coniacian	*Costellagerina bulbosa* *Costellagerina pilula* *Planoheterohelix reussi*	*Reinhardtites anthophorus* *Eiffellithus eximius* *Eprolithus floralis* *Chyastozygus stylesii* *Thiesrteinia ecclesiastica*
Arroyo Alfa–Nueva Argentina	Cenomanian	*Muricohedbergella delrioensis* *Muricohedbergella planispira* *Muricohedbergella portsdownensis* *Lingulogavelinella globosa* *Lingulogavelinella magallanica* Radiolarians	*Corollithion kennedyi* *Axopodorhabdus albianus*
	Albian–Aptian		*Gartnerago stenostaurion* *Sollasites falklandensis* *Diloma primitiva*
Pampa Rincón	Hauterivian–Valanginian	*Lenticulina nodosa* *Astacolus gibber* *Polymorphina martinezi*	*Lithraphidites bollii* *Eiffellithus striatus*

confidently by the LO of the calcareous nannofossil *Axopodorhabdus albianus* and the presence of *Corollithion kennedyi* (Burnett, 1998) (Tab. 1). The absence of this assemblage in the West well indicates an extended hiatus of upper Albian to Turonian ages.

Between the top of the Albian/Cenomanian and the overlying Coniacian–Campanian exists an important unconformity evidenced by the absence of Turonian strata. This section is characterized by a well determinable assemblage of foraminifera and calcareous nannofossils. Among the main markers are the planktic foraminifera *Costellagerina pilula*, *C. bulbosa*, and *Planoheterohelix reussi* (Malumián & Masiuk, 1978; Malumián, 1990) (Tab. 1). These occur together with benthic species like *Lenticulina muensteri*, *Saracenaria triangularis, Anomalinoides murchisonensis, Gavelinella eriksdalensis,* and *Gaudryina pyramidata*, a microfauna that correlates to the Cabeza de León Formation, named after a well located just a few kilometers away from those studied in this work (Flores *et al.*, 1973; Malumián & Masiuk, 1976b; Malumián, 1990). The calcareous nannofossils are represented by typical Coniacian–Campanian taxa of the eastern Magallanes Basin like *Reinhardites anthophorus, Rhagodiscus achlyostaurion, Eiffellithus eximius, Thiersteinia ecclesiastica, Zeugrhabdotus diplogrammus, Helicolithus trabeculatus,* and *Eprolithus floralis* (Concheyro & Angelozzi, 2002; Pérez Panera, 2012a) (Tab. 1). Also, an acme of *Helicolithus trabeculatus* was recorded in these levels, a remarkable bio-event that could be useful for intrabasinal correlation (see also Pérez Panera, 2012a).

The Maastrichtian succession is the most difficult to clearly assign due to poor preservation and very low species richness, certain affinities with the overlying Danian, as well as contamination from younger levels. It can easily be distinguished from the previously described assemblage by the sudden disappearance of planktic and calcareous benthic foraminifera. However, for obvious reasons, this leads to the absence of potential marker taxa. The foraminifera are mainly represented by agglutinated forms, with most of them remaining undetermined due to their poor preservation (Tab. 1). A microfauna like this is recognized in the literature as early Maastrichtian "Agglutinated Foraminifera Zone" of the uppermost Cabeza de León Formation (Flores *et al.*, 1973; Malumián & Masiuk, 1976b; Malumián & Náñez, 1983, 2011). However, the authors cannot correlate their assemblage with certainty to this zone because the occurrence of undetermined agglutinants clearly continues into the Paleocene, as evidenced by the presence of calcareous nannofossil species such as *Chiasmolithus danicus, Hornibrookina edwardsii,* and *Prinsius tenuiculus*. Furthermore, the determination of the K/Pg boundary is blurred by the caving of younger nannofossils into the Maastrichtian succession of these wells.

CONCLUSIONS

In summary, five discrete assemblages were recorded in the succession of Cretaceous sediments from the West, North, and East wells. These sediments are of Valanginian–Hauterivian, Aptian–Albian, Cenomanian, Coniacian–Campanian, and Maastrichtian age. These assemblages correlate well with formations previously described for the Magallanes Basin, which include Pampa Rincón, Nueva Argentina, Arroyo Alfa, and Cabeza de León (see Flores *et al.*, 1973) (Tab. 1). These findings are consistent across all three studied wells.

There are two well determinable biostratigraphical hiatuses of Barremian and Turonian age, evidenced by distinct faunal turnovers between the Valanginian–Hauterivian and the Aptian–Albian assemblages, as well as between the top of the Albian/Cenomanian and the Coniacian–Campanian assemblage.

The presence of almost exclusively agglutinated foraminifera and the few nannofossils in the Maastrichtian complicate the determination of the exact position of the important K/Pg boundary which will be discussed in more detail in another contribution.

ACKNOWLEDGMENTS

We would like to thank G. Covellone, M. Miller, and the entire Austral Exploration group of YPF for the provision of the sample material, the enabling of this project, and the permission to publish this paper. Special thanks to J. Mennucci and S. Pugnaire for the preparation and picking of the samples. Cordial thanks to D. Ronchi and L. Hiriart for their help in determining some of the samples, and the productive discussions about foraminiferal taxonomy. PE-APA Alternate Director A. P. Carignano, the Editorial Committee and two anonymous reviewers are also acknowledged for their constructive corrections and suggestions. This study is part of Y-TEC project I+D+i 602. JMT was financed by CONICET fellowship PDTS 153.

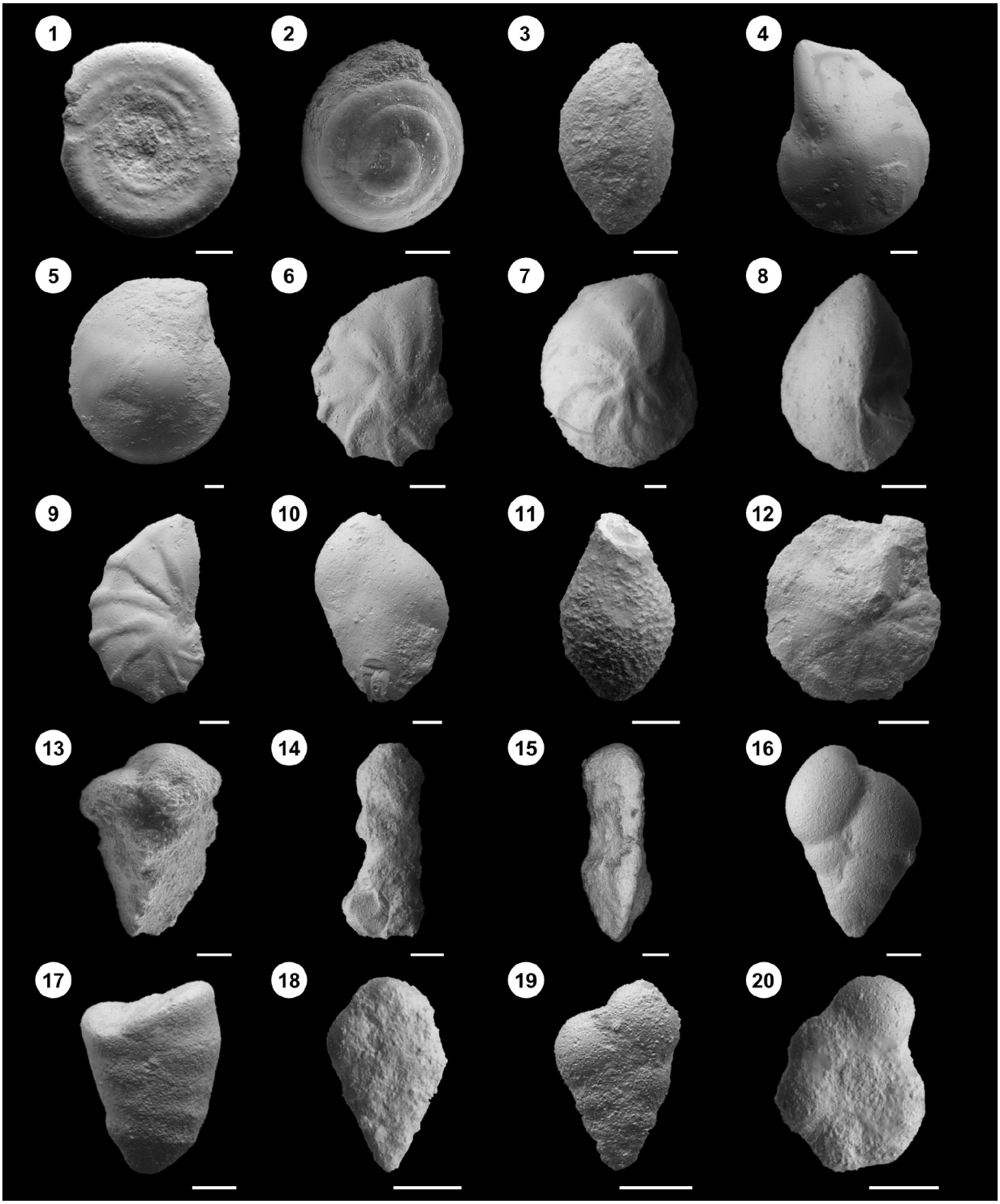

Figure 2. Cretaceous foraminifera recovered from the studied wells, photographed with a scanning electron microscope. **1, *Ammodiscus cretaceus***, East well, **YT.RMP_M.000010.38**; **2, *Glomospira charoides***, West well, **YT.RMP_M.000011.45**; **3, *Pseudosigmoilina*** cf. ***Q. antiqua***, West well, **YT.RMP_M.000011.46**; **4, *Lenticulina gaultina***, East well, **YT.RMP_M.000010.42**; **5, *Lenticulina muensteri***, North well, **YT.RMP_M.000008.35**; **6, *Lenticulina nodosa***, North well, **YT.RMP_M.000008.48**; **7, *Lenticulina spissocostata***, North well, **YT.RMP_M.000008.38**; **8, *Saracenaria triangularis***, North well, **YT.RMP_M.000008.44**; **9, *Astacolus gibber*** West well, **YT.RMP_M.000011.58**; **10, *Polymorphina martinezi***, West well, **YT.RMP_M.000011.57**; **11, *Ramulina*** sp. B, East well, **YT.RMP_M.000010.38**; **12, *Epistomina caracolla***, West well, **YT.RMP_M.000011.56**; **13, *Gaudryina pyramidata***, East well, **YT.RMP_M.000010.38**; **14, *Spiroplectinata annectens***, North well, **YT.RMP_M.000008.39**; **15, *Tritaxia gaultina australis***, North well, **YT.RMP_M.000008.40**; **16, *Dorothia mordojovichi***, North well, **YT.RMP_M.000008.38**; **17, *Marssonella oxycona***, East well, **YT.RMP_M.000010.38**; **18, *Planoheterohelix globulosa***, North well, **YT.RMP_M.000008.36**; **19, *Planoheterohelix reussi***, West well, **YT.RMP_M.000011.46**; **20, *Globigerinelloides asper***, North well, **YT.RMP_M.000008.37**. Scale bar= 100 µm.

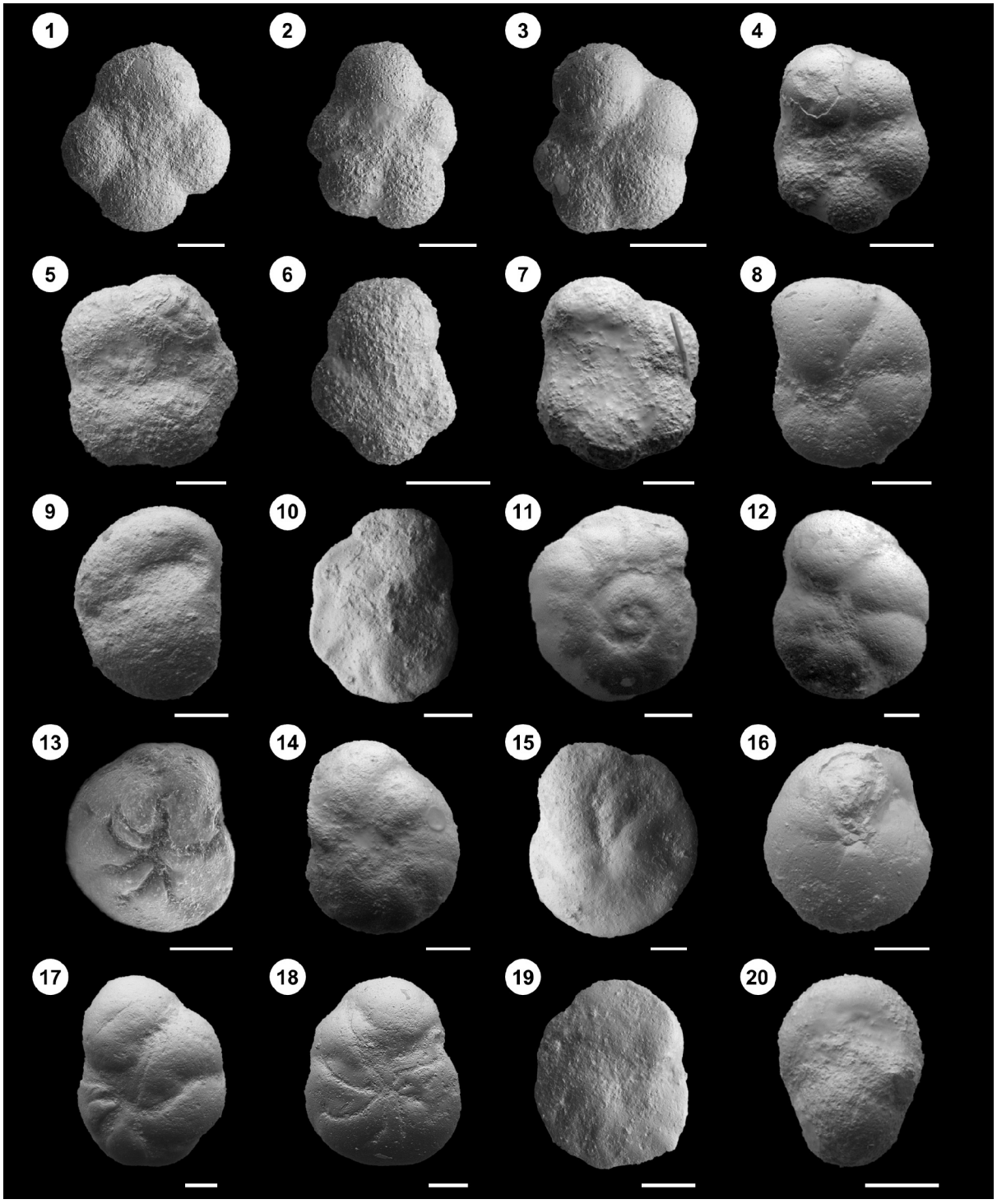

Figure 3. Cretaceous foraminifera recovered from the studied wells, photographed with a scanning electron microscope. **1, *Costellagerina bulbosa***, North well, **YT.RMP_M.000008.37**; **2, *Costellagerina pilula***, North well, **YT.RMP_M.000008.37**; **3, *Muricohedbergella delrioensis***, North well, **YT.RMP_M.000008.38**; **4, *Muricohedbergella planispira***, West well, **YT.RMP_M.000011.46**; **5, *Muricohedbergella portsdownensis***, West well, **YT.RMP_M.000011.48**; **6, *Whiteinella baltica***, North well, **YT.RMP_M.000008.37**; **7, *Globotruncana lapparenti***, East well, **YT.RMP_M.000010.38**; **8, *Valvulineria*** cf. ***lenticula***, West well, **YT.RMP_M.000011.51**; **9, *Alabamina australis***, West well, **YT.RMP_M.000011.44**; **10, *Osangularia utaturensis***, North well, **YT.RMP_M.000008.39**; **11, *Anomalina cenomanica***, East well, **YT.RMP_M.000010.40**; **12, *Anomalinoides murchisonensis***, East well, **YT.RMP_M.000010.38**; **13, *Orithostella indica***, East well, **YT.RMP_M.000010.41**; **14, *Berthelina intermedia***, East well, **YT.RMP_M.000010.40**; **15, *Gavelinella eriksdalensis***, North well, **YT.RMP_M.000008.34**; **16, *Gyroidina exserta***, West well, **YT.RMP_M.000011.46**; **17, *Lingulogavelinella globosa***, North well, **YT.RMP_M.000008.38**; **18, *Lingulogavelinella magallanica***, North well, **YT.RMP_M.000008.38**; **19, *Notoplanulina rakauroana***, North well, **YT.RMP_M.000008.34**; **20, *Pullenia cretacea***, West well, **YT.RMP_M.000011.45**. Scale bar= 100 µm.

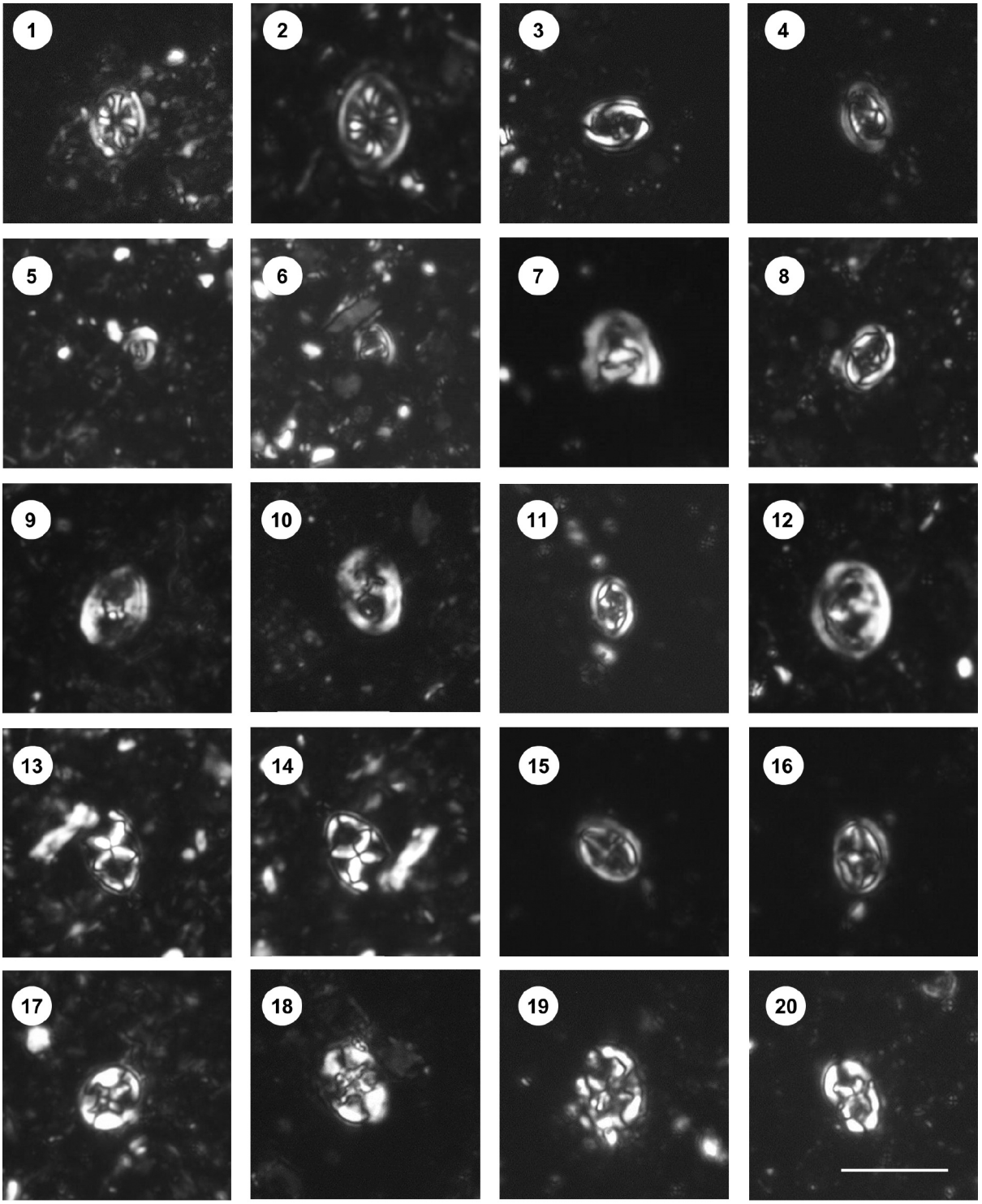

Figure 4. Calcareous nannofossils recovered from the studied wells, photographed with a polarized light microscope. **1, *Ahmuellerella octoradiata***, West well, **YT.RMP_N.000011.51**; **2, *Ahmuellerella octoradiata***, North well, **YT.RMP_N.000008.35**; **3, *Placozygus fibuliformis***, West well, **YT.RMP_N.000011.53**; **4, *Placozygus sigmoides***, West well, **YT.RMP_N.000011.51**; **5, *Zeugrhabdotus angelozziae***, East well, **YT.RMP_N.000010.29**; **6, *Zeugrhabdotus angelozziae***, East well, **YT.RMP_N.000010.29**; **7, *Zeugrhabdotus diplogrammus***, North well, **YT.RMP_N.000008.44**; **8, *Zeugrhabdotus noeliae***, North well, **YT.RMP_N.000008.36**; **9, *Zeugrhabdotus scutula***, North well, **YT.RMP_N.000008.32**; **10, *Zeugrhabdotus scutula***, West well, **YT.RMP_N.000011.47**; **11, *Zeugrhabdotus trivectis***, West well, **YT.RMP_N.000011.57**; **12, *Reinhardtites anthophorus***, North well, **YT.RMP_N.000008.32**; **13, *Chiastozygus stylesii***, West well, **YT.RMP_N.000011.51**; **14, *Chiastozygus stylesii***, West well, **YT.RMP_N.000011.51**; **15–16. *Diloma primitiva***, North well, **YT.RMP_N.000008.45**; **17, *Eiffellithus eximius***, West well, **YT.RMP_N.000011.47**; **18, *Eiffellithus turriseiffelii***, West well, **YT.RMP_N.000011.51**; **19, *Eiffellithus striatus***, West well, **YT.RMP_N.000011.57**; **20, *Eiffellithus striatus***, North well, **YT.RMP_N.000008.45**. Scale bar= 10 µm.

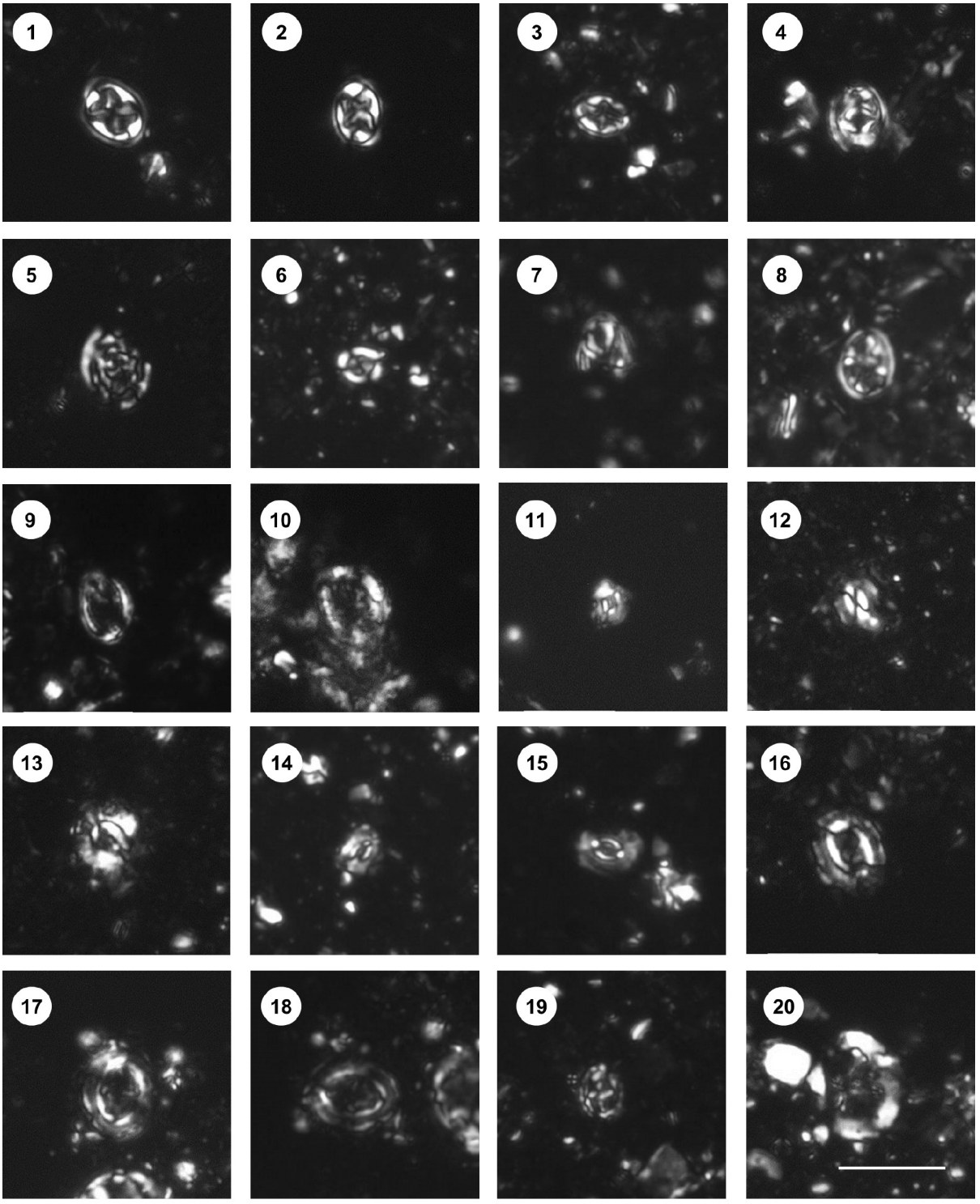

Figure 5. Calcareous nannofossils recovered from the studied wells, photographed with a polarized light microscope. **1, *Helicolithus trabeculatus***, West well, **YT.RMP_N.0 00011.51**; **2, *Helicolithus trabeculatus***, West well, **YT.RMP_N.000011.53**; 3, ***Helicolithus turonicus***, North well, **YT.RMP_N.000008.33**. 4, ***Rhagodiscus achlyostaurion***, West well, **YT.RMP_N.000011.53**; **5, *Rhagodiscus asper***, West well, **YT.RMP_N.000011.53**; **6, *Corollithion kennedyi***, East well, **YT.RMP_N.000010.30**; **7, *Axopodorhabdus albianus***, East well, **YT.RMP_N.000010.30**; **8, *Axopodorhabdus albianus***, North well, **YT.RMP_N.000008.35**; **9, *Cribrosphaerella ehrenbergii***, West well, **YT.RMP_N.000011.51**; **10, *Octocyclus reinhardtii***, West well, **YT.RMP_N.000011.56**; **11, *Biscutum constans***, West well, **YT.RMP_N.000011.51**; **12, *Biscutum coronum***, West well, **YT.RMP_N.000011.51**; **13, *Biscutum magnum***, West well, **YT.RMP_N.000011.51**; **14, *Seribiscutum gaultensis***, East well, **YT.RMP_N.000010.34**; **15, *Seribiscutum gaultensis***, East well, **YT.RMP_N.000010.35**; **16, *Seribiscutum primitivum***, West well, **YT.RMP_N.000011.51**; **17–18, *Sollasites falklandensis***, West well, **YT.RMP_N.000011.52**; **19, *Prediscosphaera spinosa***, East well, **YT.RMP_N.000010.31**; **20, *Grantarhabdus coronadventis***, West well, **YT.RMP_N.000011.52**. Scale bar= 10 µm.

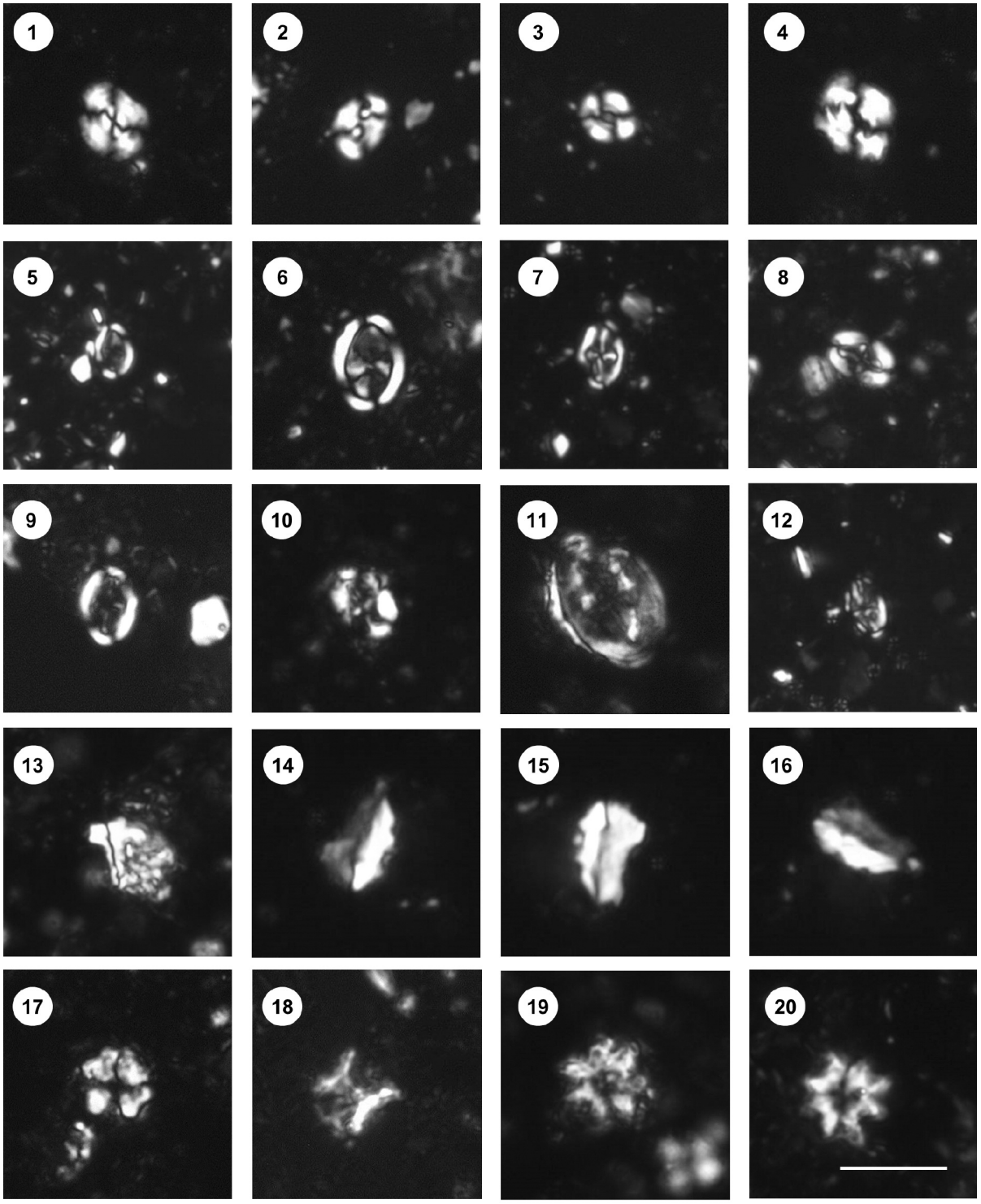

Figure 6. Calcareous nannofossils recovered from the studied wells, photographed with a polarized light microscope. **1,** ***Watznaueria barnesae***, West well, **YT.RMP_N.000011.49**; **2,** ***Watznaueria biporta***, West well, **YT.RMP_N.000011.52**; **3,** ***Watznaueria britannica***, West well, **YT.RMP_N.000011.56**; **4,** ***Watznaueria fossacincta***, West well, **YT.RMP_N.000011.50**; **5,** ***Arkhangelskiella confusa***, East well, **YT.RMP_N.000010.29**; **6,** ***Arkhangelskiella cymbiformis***, West well, **YT.RMP_N.000011.51**; **7,** ***Broinsonia matalosa***, East well, **YT.RMP_N.000010.34**; **8,** ***Broinsonia matalosa***, East well, **YT.RMP_N.000010.31**; **9,** ***Broinsonia signata***, West well, **YT.RMP_N.000011.51**; **10,** ***Thiersteinia ecclesiastica***, West well, **YT.RMP_N.000011.51**; **11,** ***Gartnerago segmentatum***, West well, **YT.RMP_N.000011.50**; **12,** ***Gartnerago stenostaurion***, North well, **YT.RMP_N.000008.42**; **13,** ***Lucianorhabdus maleformis***, North well, **YT.RMP_N.000008.35**; **14–16,** ***Lithraphidites bollii***, North well, **YT.RMP_N.000008.44**; **17,** ***Eprolithus floralis***, West well, **YT.RMP_N.000011.51**; **18,** ***Eprolithus floralis***, side view, West well, **YT.RMP_N.000011.51**; **19,** ***Eprolithus moratus***, North well, **YT.RMP_N.000008.39**; **20,** ***Eprolithus octopetalus***, North well, **YT.RMP_N.000008.36**. Scale bar= 10 µm.

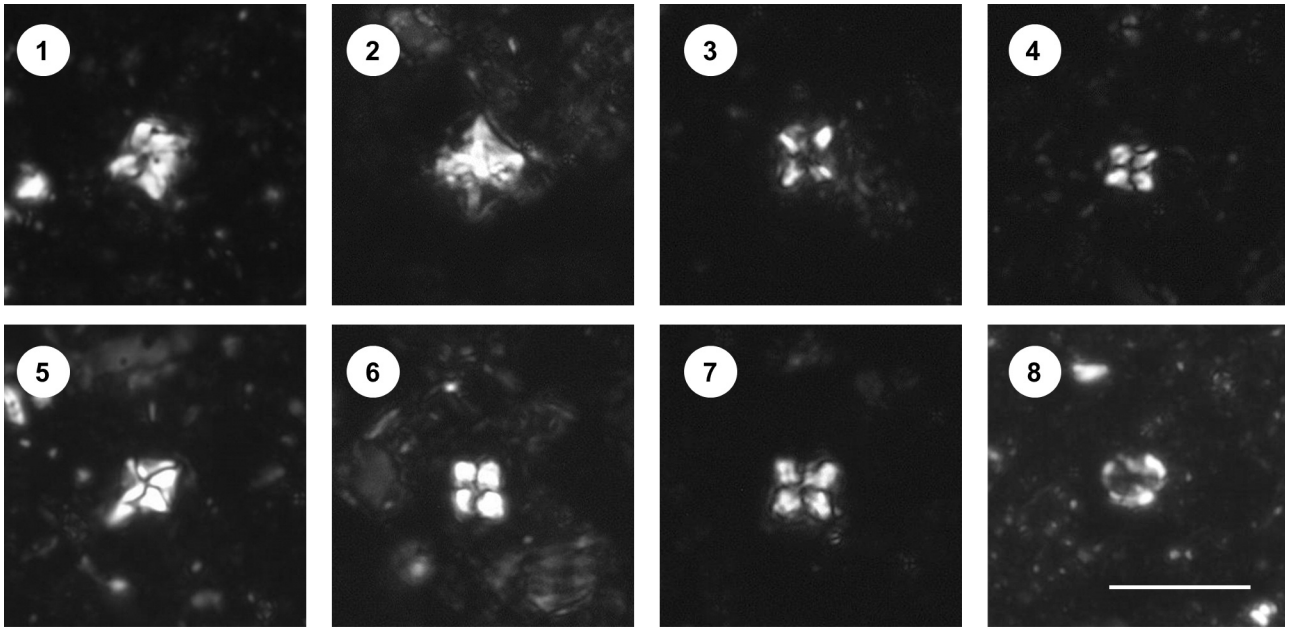

Figure 7. Calcareous nannofossils recovered from the studied wells, photographed with a polarized light microscope. **1, *Micula adumbrate***, West well, **YT.RMP_N.000011.51**; **2, *Micula concava***, West well, **YT.RMP_N.000011.49**; **3, *Micula staurophora***, West well, **YT.RMP_N.000011.50**; **4, *Micula staurophora***, West well, **YT.RMP_N.000011.46**; **5, *Micula swastika***, North well, **YT.RMP_N.000008.34**; **6, *Quadrum gartneri***, West well, **YT.RMP_N.000011.51**; **7, *Uniplanarius gothicus***, West well, **YT.RMP_N.000011.49**; **8, *Radiolithus planus***, East well, **YT.RMP_N.000010.32**. Scale bar= 10 µm.

REFERENCES

Alth, A. (1850). Geognostische-palaeontologische Beschreibung der nächsten Umgebung von Lemberg. *Haidinger's Naturwissenschaftliche Abhandlung*, *3*(2), 197–198.

Angelozzi, G. N. (1987). Nanofósiles paleocenos del noreste de la Cuenca Neuquina, República Argentina. *Ameghiniana*, *24*(3–4), 299–307.

Applegate, J. L. & Bergen, J. A. (1988). Cretaceous calcareous nannofossil biostratigraphy of sediments recovered from the Galicia Margin, ODP Leg. 103. *Proceedings of the Ocean Drilling Program, Scientific Results*, *103*, 293–348.

Arkhangelsky, A. D. (1912). [Upper Cretaceous deposits of east European Russia]. *Materialien zur Geologie Russlands*, *25*, 1–631. [in Russian]

Ballent, S., Concheyro, A., & Sagasti, G. (2006). Bioestratigrafía y paleoambiente de la Formación Agrio (Cretácico Inferior), en la Provincia de Mendoza, Cuenca Neuquina, Argentina. *Revista Geológica de Chile*, *33*(1), 47–79.

Bandy, O. L. (1951). Upper Cretaceous Foraminifera from the Carlsbad area, San Diego County, California. *Journal of Paleontology*, *25*(4), 488–513.

Bartenstein, H. (1954). Revision von Berthelin's Mémoire 1880 über die Alb Foraminiferen von Montcley. *Senckenbergiana Lethaea*, *35*(1–2), 37–50.

Bartenstein, H. (1962). Neue Foraminiferen aus Unterkreide und Oberkeuper NW-Deutschlands und der Schweiz. *Senckenbergiana Lethaea*, *43*(2), 135–149.

Bartenstein, H. (1965). Taxonomische Revision und Nomenklatur zu Franz E. Hecht "Standard-Gliederung der Nordwestdeutschen Unterkreide nach Foraminiferen" (1938). Teil 4, Alb, mit Beschreibungen von Arten aus verschiedenen Unterkreide-Niveaus. *Senckenbergiana Lethaea*, *46*, 327–366.

Bartenstein, H., Bettenstaedt, F., & Bolli, H. M. (1957). Die Foraminiferen der Unterkreide von Trinidad, B.W.I. 1. Teil, Cuche- und Toco-Formation. *Eclogae Geologicae Helvetiae*, *50*(1), 5–67.

Basov, I. A. & Krasheninnikov, V. A. (1983). Benthic foraminifers in Mesozoic and Cenozoic sediments of the southwestern Atlantic as an indicator of paleoenvironment, Deep Sea Drilling Project, Leg 71. *Initial Reports of the Deep Sea Drilling Project*, *71*, 739–787.

Beckmann, J. P. (1978). Late Cretaceous Smaller Benthic Foraminifers from Sites 363 and 364 DSDP Leg 40, Southeast Atlantic Ocean. *Initial Reports of the Deep Sea Drilling Project*, *40*, 759–781.

Belford, D. J. (1960). Upper Cretaceous Foraminifera from the Toolonga Calcilutite and Gingin Chalk, Western Australia. *Bureau of Mineral Resources, Geology and Geophysics, Bulletin*, *57*, 1–198.

Bergen, J. A. (1994). Berriasian to early Aptian calcareous nannofossils from the Vocotonian Trough (SE France) and Deep Sea Drilling Site 534, new nannofossil taxa and a summary of low-latitude biostratigraphic events. *Journal of Nannoplankton Research*, *16*(2), 59–69.

Bermúdez, P. J. (1952). Estudio sistemático de los Foraminíferos rotaliformes. *Venezuela Ministerio de Minas e Hidrocarburos, Boletín de Geología*, *2*(4), 1–230.

Bertels, A. (1980). Estratigrafía y foraminíferos (Protozoa) bentónicos del límite Cretácico–Terciario en el área tipo de la Formación Jagüel, provincia del Neuquén, República Argentina. *Actas de 2° Congreso Argentino de Paleontología y Bioestratigrafía y 1° Congreso Latinoamericano de Paleontología* (pp. 47–91). Buenos Aires.

Berthelin, G. (1879). Foraminifères du Lias moyen de la Vendée. *Revue et magasin de zoologie pure et appliquée, Paris*, *3*(7), 24–41.

Berthelin, G. (1880). Mémoire sur les Foraminifères fossiles de l'Etage Albien de Moncley (Doubs). *Mémoires de la Société Géolo-*

gique de France, *3*(1), 1–84.

Biddle, K. T., Uliana, M. A., Mitchum Jr., R. M., Fitzgerald, M. G., & Wright, R. C. (1986). The Stratigraphic and structural evolution of the central and eastern Magallanes basin, southern South America. In P. A. Allen & P. Homewoods (Eds.), *Foreland Basins. Special Publication* (vol. 8, pp. 41–61). International Assemblage of Sedimentologists.

Black, M. (1965). Coccoliths. *Endeavour*, *24*(93), 131–137.

Black, M. (1967). New names for some coccolith taxa. *Proceedings of the Geological Society of London*, *1640*, 139–145.

Black, M. (1971). Coccoliths of the Speeton Clay and Sutterby Marl. *Proceedings of the Yorkshire Geological Society*, *38*(3), 381–424.

Black, M. (1972). British Lower Cretaceous Coccoliths. I - Gault Clay (part 1). *Palaeontological Society of London (Monograph)*, *126*, 1–48.

Black, M. (1973). British Lower Cretaceous Coccoliths. I - Gault Clay (part 2). *Palaeontological Society of London (Monograph)*, *127*, 49–112.

Black, M. & Barnes, B. (1959). The structure of Coccoliths from the English Chalk. *Geological Magazine*, *96*, 321–328.

Blainville, H. M. D. de. (1824). Mollusques, Mollusca. In G. Cuvier, (Ed.), *Dictionnaire des Sciences Naturelles,* (vol. 32, pp. 1–178). Levrault, Strasbourg et Paris, & Le Normant.

Bolli, H. M., Beckmann, H., & Saunders, J. B. (1994). *Benthic foraminiferal biostratigraphy of the South Caribbean region.* Cambridge University Press.

Boomgaart, L. (1949). *Smaller foraminifera from Bodjonegoro (Java).* [PhD Thesis, University of Utrecht]. Unedited.

Bornemann, A., & Mutterlose, J. (2006). Size analyses of the coccolith species *Biscutum constans* and *Watznaueria barnesae* from the Late Albian "Niveau Breistroffer" (SE France), taxonomic and palaeoecological implications. *Geobios*, *39*(5), 599–615.

Bown, P. R. (2005). Early to Mid–Cretaceous calcareous nannoplankton from the Northwest Pacific Ocean, Leg 198, Shatsky Rise. *Proceedings of the Ocean Drilling Program, Scientific Results*, *198*, 1–82.

Bown, P. R. & Cooper, M. K. E. (1989). New calcareous nannofssils from the Jurassic. *Journal of Micropalaeontology*, *8*(1), 91–96.

Bown, P. R. & Cooper, M. K. E. (1998). Jurassic. In P. R. Bown (Ed.), *Calcareous Nannofossil Biostratigraphy. British Micropalaeontological Society Publication Series* (pp. 34–85). Kluwer Academic Publishers.

Bown, P. R., Rutledge, D. C., Crux, J. A., & Gallagher, L. T. (1998). Lower Cretaceous. In P. R. Bown (Ed.), *Calcareous Nannofossil Biostratigraphy*. *British Micropalaeontological Society Publications Series* (pp. 86–131). Kluwer Academic Publishers.

Bown, P. R. & Young, J. R. (1997). Mesozoic calcareous nannoplankton classification. *Journal of Nannoplankton Research*, *19*, 21–36.

Bramlette, M. N. & Martini, E. (1964). The great change in calcareous nannoplankton fossils between the Maastrichtian and Danian. *Micropalaeontology*, *10*, 291–322.

Bramlette, M. N. & Sullivan, F. R. (1961). Coccolithophorids and related nannoplankton of the early Tertiary in California. *Micropaleontology*, *2*, 129–188.

Brotzen, F. (1936). Foraminiferen aus dem schwedischen untersten Senon von Eriksdal in Schonen. *Arsbok Sveriges Geologiska Undersökning Series C, 30*(3), 1–206.

Brotzen, F. (1940). Flinträннans och Trindelränнans geologi (Öresund). *Årsbok Sveriges Geologiska Undersökning*, *34*(5), 1–33.

Brotzen, F. (1942). Die Foraminiferengattung *Gavelinella* nov. gen. und die Systematik der Rotaliiformes. *Sveriges Geologiska Undersökning*, *36*(8), 1–60.

Brotzen, F. (1945). De geologiska resultaten från borrningarna vid Höllviken. *Sveriges Geologiska Undersökning Series C, 465*, 1–64.

Bukry, D. (1969). Upper Cretaceous coccoliths from Texas and Europe. *The University of Kansas Paleontological Contributions, Article 51 (Protista 2)*, 1–79.

Burnett, J. A. (1997). New taxa and new combinations of Cretaceous nannofossils, and a note on the origin of *Petrarhabdus* (Deflandre) Wind & Wise. *Journal of Nannoplankton Research*, *19*(2), 133–146.

Burnett, J. A. (1998). Upper Cretaceous. In P. R. Bown (Ed.), *Calcareous Nannofossil Biostratigraphy. British Micropaleontologcal Society Publications Series* (pp. 132–199). Kluwer Academic Publishers.

Burns, D. A. (1976). Nannofossils from the Lower and Upper Cretaceous chalk deposits, Nettleton, Lincolnshire, England. *Revista Española de Micropaleontología*, *8*(2), 279–300.

Caratini, C. (1963). Contribution à l'étude des coccolithes du Cénomanien supérieur et du Turonien de la région de Rouen. [PhD Thesis, Faculté des Sciences, Université d'Alger].

Caron, M. (1978). Cretaceous planktonic foraminifers from DSDP Leg 40, southeastern Atlantic Ocean. *Initial Reports of the Deep Sea Drilling Project*, *40*, 651–678.

Carpenter, W. B., Parker, W. K., & Jones, J. R. (1862). *Introduction to the study of the foraminifera*. The Ray Society.

Carsey, D. O. (1926). Foraminifera of the Cretaceous of central Texas. *University of Texas Bulletin, 2612*, 1–56.

Čepek, P. & Hay, W. W. (1969). Calcareous nannoplankton and biostratigraphic subdivision of the Upper Cretaceous. *Transactions of the Gulf Coast Assemblage of Geological Societies*, *19*, 323–336.

Cole, W. S. (1938). Stratigraphy and micropaleontology of two deep wells in Florida. *Florida State Geological Survey Geological Bulletin*, *16*, 1–73.

Concheyro, A. (1995). *Nanofósiles calcáreos del Cretácico Superior y Paleógeno de Patagonia, Argentina*. [PhD Thesis, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Buenos Aires.] Retrieved from https://bibliotecadigital.exactas.uba.ar/collection/tesis/document/tesis_n2754_Concheyro

Concheyro, A., & Angelozzi, G. N. (2002). Nanofósiles calcáreos de la provincia de Santa Cruz, Argentina. In M. J. Haller (Ed.), *Geología y recursos naturales de la provincia de Santa Cruz* (pp. 495–517). Asociación Geológica Argentina.

Crux, J. A. (1981). New calcareous nannofossil taxa from the Cretaceous of South East England. *Neues Jahrbuch für Geologie und Paläontologie Monatshefte, 10*, 633–640.

Crux, J. A. (1982). Upper Cretaceous (Cenomanian to Campanian) calcareous nannofossils. In A. R. Lord (Ed.), *A Stratigraphical Index of Calcareous Nannofossils* (pp. 81–135). Ellis Horwood.

Crux, J. A. (1989). Biostratigraphy and palaeogeographical applications of Lower Cretaceous nannofossils from northwestern Europe. In J. A. Crux & S. E. van Heck (Eds.), *Nannofossils and their applications* (pp. 143–211). Ellis Horwood.

Crux, J. A. (1991). Albian calcareous nannofossils from the Gault Clay of Munday's Hill (Bedfordshire, England). *Journal of Micropalaeontology*, *10*(2), 203–221.

Crux, J. A., Hamilton, G. B., Lord, A. R., & Taylor, R. J. (1982). *Tortolithus* gen. nov. Crux and new combinations of Mesozoic calcareous nannofossils from England. *International Nannoplankton Association Newsletter*, *4*(2), 98–101.

Cushman, J. A. (1910). A monograph of the Foraminifera of the North Pacific Ocean. Part I. Astrorhizidae and Lituolidae. *Bulletin of the United States National Museum*, *71*(1), 1–134.

Cushman, J. A. (1926a). The foraminifera of the Velasco Shale of the Tampico Embayment. *Bulletin of the American Assemblage of Petroleum Geologists*, *10*(6), 581–612.

Cushman, J. A. (1926b). Some Foraminifera from the Mendez Shale of eastern Mexico. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *2*(1), 16–26.

Cushman, J. A. (1926c). Foraminifera of the typical Monterey of California. *Contribution from the Cushman Laboratory for Foraminiferal Research*, *2*(30), 53–69.

Cushman, J. A. (1927). An outline of a reclassification of the foraminifera. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *3*(1), 1–105.

Cushman, J. A. (1933). Some new foraminiferal genera. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *9*(2), 32–38.

Cushman, J. A. (1936a). Notes on some American Cretaceous Frondicularias. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *12*(1), 11–22.

Cushman, J. A. (1936b). Cretaceous Foraminifera of the family Chilostomellidae. *Contribution to Laboratory for Foraminiferal Research*, *12*(4), 71–78.

Cushman, J. A. (1937). Some notes on Cretaceous species of *Marginulina*. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *13*(4), 91–99.

Cushman, J. A. (1938a). Additional new species of American Cretaceous Foraminifera. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *14*(2), 31–50.

Cushman, J. A. (1938b). Cretaceous species of Gümbelina and related genera. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *14*(1), 2–28.

Cushman, J. A. (1939). New American Cretaceous Foraminifera. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *15*(4), 89–93.

Cushman, J. A. (1946). Upper Cretaceous Foraminifera of the Gulf Coastal Region of the United States and Adjacent Areas. *Geological Survey Professional paper*, *206*, 1–241 p.

Cushman, J. A. & Ten Dam, A. (1948). *Globigerinelloides*, a new genus of the Globigerinidae. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *24*(2), 42–43.

d'Orbigny, A. D. (1826). Tableau méthodique de la classe des Céphalopodes. *Annales des Sciences Naturelles*, *7*, 245–314.

d'Orbigny, A. D. (1839). *Foraminifères, in de la Sagra R., Histoire physique, politique et naturelle de l'ile de Cuba.* A. Bertrand.

d'Orbigny, A. D. (1840). Mémoire sur les foraminifères de la craie blanche du bassin de Paris. *Mémoires de la Société géologique de France*, *4*(1), 1–51.

d'Orbigny, A. D. (1846). *Foraminifères fossiles du bassin tertiaire de Vienne (Austriche).* Gide et Compe.

Deflandre, G. (1947). *Braarudosphaera* nov. gen., type d'une famille nouvelle de Coccolithophoridés actuels à éléments composites. *Comptes Rendus (Hebdomadaires des Séances) de l'Académie des Sciences Paris*, *225*, 439–441.

Deflandre, G. (1952). Sous-embranchement des flagellés. In J. Piveteau (Ed.), *Traité de paléontologie* (pp. 107–115). Masson & Cie.

Deflandre, G. (1953). Hétérogénéité intrinsèque et pluralité des éleménts dans les coccolithes actuels et fossiles. *Comptes Rendus (Hebdomadaires des Séances) de l'Académie des Sciences, Paris*, *237*, 1785–1787.

Deflandre, G. (1959). Sur les nannofosiles calcaires et leur systématique. *Revué de Micropaléontologie*, *2*, 127–152.

Deflandre, G. (1963). Sur les Microrhabdulidés, famille nouvelle de nannofossiles calcaires. *Comptes Rendus (Hebdomadaires des Séances) de l'Académie des Sciences Paris*, *256*, 3484–3487.

Deflandre, G. & Fert, C. (1954). Observations sur les Coccolithophoridés actuels et fossiles en microscopie ordinaire et électronique. *Annales de Paléontologie*, *40*, 115–176.

Defrance, J. L. M. (1824). Mineralogie et Geologie. In G. Cuvier (Ed.), *Dictionnaire de Science Naturelles* (vol. 32, pp. 171–191). Levrault, Strasbourg et Paris, & Le Normant.

Defrance, J. L. M. (1826). Mineralogie et Geologie. In G. Cuvier (Ed.), *Dictionnaire de Science Naturelles* (vol. 41). Levrault, Strasbourg et Paris, & Le Normant.

Doeven, P. H. (1983). Cretaceous nannofossil stratigraphy and paleoecology of the Canadian Atlantic Margin. *Bulletin of the Geological Survey of Canada*, *356*, 1–70.

Douglas, R. G. & Rankin, C. (1969). Cretaceous planktonic foraminifera from Bornholm and their zoogeographic significance. *Lethaia*, *2*(3), 185–217.

Earland, A. (1934). Foraminifera. Part III. The Falklands sector of the Antarctic (excluding South Georgia). In *Discovery Reports* (vol. 10, pp. 1–208). Cambridge University Press.

Ehrenberg, C. G. (1840). Über die Bildung der Kreidefelsen und des Kreidemergels durch unsichtbare Organismen. *Physikalische Abhandlungen der Königlischen Akademie der Wissenschaften zu Berlin*, *1838*, 59–147.

Ehrenberg, C. G. (1854). *Mikrogeologie. Das Erden und Felsen schaffende Wirken des unsichtbar kleinen selbstständigen Lebens auf der Erde*. Leopold Voss.

Eicher, D. L. & Worstell, P. (1970). Cenomanian and Turonian Foraminifera from the Great Plains, United States. *Micropaleontology*, *16*(3), 269–324.

Ellis, B. & Messina, A. (1940 *et seq*). Catalogue of Foraminifera. *American Museum of Natural History, Special Publication Series*, 30 volumes.

Espitalié, J. & Sigal, J. (1963). Contribution à l'étude des foraminifères (micropaléontologie-microstratigraphie) du jurassique supérieur et du néocomien du bassin de Majunga (Madagascar). *Annales Géologiques de Madagascar*, *32*, 1–150.

Fichtel, L. v. & Moll, J. P. C. v. (1798). *Testacea microscopia, aliaque minuta ex generibus* Argonauta *et* Nautilus*, ad naturam picta et descripta.* A. Pichler.

Finlay, H. J. (1939). New Zealand Foraminifera, Key Species in Stratigraphy. *Transactions of the Royal Society of New Zealand*, *69*(3), 309–329.

Finlay, H. J. (1940). New Zealand Foraminifera, Key species in stratigraphy. *Transactions and Proceedings of the Royal Society of New Zealand*, *69*(4), 448–472.

Flores, M. A., Malumián, N., Masiuk, V., & Riggi, J. C. (1973). Estratigrafía Cretácica del subsuelo de Tierra del Fuego. *Revista de la Asociación Geológica Argentina*, *28*(4), 407–437.

Forchheimer, S. (1968). Die Coccolithen des Gault-Cenoman und Turon in der Bohrung Höllviken I, Südwest-Schweden. *Sveriges Geologiska Undersökning Serie C*, *62*, 1–84.

Forchheimer, S. (1970). Scanning electron microscope studies of some Cenomanian coccospheres and coccoliths from Bornholm (Denmark) and Köpingsberg (Sweden). *Sveriges Geologiska Undersökning Serie C*, *64*, 1–43.

Forchheimer, S. (1972). Scanning electron microscope studies of Cretaceous coccoliths from the Köpingsberg Borehole No. 1, SE Sweden. *Sveriges Geologiska Undersökning, Series C*, *65*, 1–141.

Fornasini, C. (1902). Sinossi metodica, dei Foraminiferi sin qui rinvenuti nella sabbia del Lido di Rimini. *Memorie della Reale Accademia*

delle Scienze dell'Istituto di Bologna, *5*(10), 1–68.

Franke, A. (1914). Die foraminiferen und ostracoden des emschers, besonders von oberveing und Derne nördlich von Dortmund. *Deutsche Geologische Gesellschaft Zeitschriften*, *66*, 428–443.

Franke, A. (1928). Die Foraminiferen der Oberen Kreide Nord- und Mitteldeutschlands. *Abhandlungen der Preussischen Geologischen Landesanstalt, Berlin, Neue Folge*, *111*, 1–207.

Gale, A. S., Kennedy, W. J., Burnett, J. A., Caron, M., & Kidd, B. E. (1996). The Late Aptian to Early Cenomanian succession at Mont Risou, near Rosans (Drôme, SE France), an integrated study (ammonites, inoceramids, planktonic foraminifera, nannofossils, oxygen and carbon isotopes). *Cretaceous Research*, *17*(5), 515–606.

Galeazzi, J. S. (1998). Structural and stratigraphic evolution of the Western Malvinas Basin. *American Assemblage of Petroleum Geologist, Bulletin*, *82*(4), 596–636.

Gardet, M. (1955). Contribution à l'étude des coccolithes des terrains néogènes de l'Algérie. *Publications du Service de la Carte Géologique de l'Algérie (Nouvelle Série)*, *5*, 477–550.

Gartner, S. (1968). Coccoliths and related calcareous nannofossils from Upper Cretaceous deposits of Texas and Arkansas. *The University of Kansas Paleontological Contributions, Article 48 (Protista 1)*, 1–56.

Gazdzicka, E. (1978). Calcareous nannoplankton from the uppermost Cretaceous and Paleogene deposits of the Lublin Upland. *Acta Geologica Polonica*, *28*(3), 335–375.

Georgescu, M. D. (2000). Late Albian-Turonian planktonic foraminifera in the Romanian western Black Sea offshore. *Revista Española de Micropaleontología*, *32*(2), 157–173.

Georgescu, M. D. & Huber, B. T. (2009). Early evolution of the cretaceous serial planktic foraminifera (late Albian-Cenomanian). *Journal of Foraminiferal Research*, *39*(4), 335–360.

Goës, A. T. (1894). A synopsis of the Arctic and Scandinavian Recent marine Foraminifera hitherto discovered. *Kongliga Svenska Vetenskaps-Akademiens Handlingar*, *25*(9), 1–127.

González Estebenet, M. S., Guler, M. V., & Pérez Panera, J. P. (2020). Maastrichtian to Danian organic-walled dinoflagellate cysts and calcareous nannofossils from Eastern Austral Basin, Patagonia, Argentina. *Review of Palaeobotany and Palynology.* https://doi.org/10.1016/j.revpalbo.2020.104342

Górka, H. (1957). Les Coccolithophoridés du Maestrichtien supérieur de Pologne. *Acta Palaeontologica Polonica*, *2*(2–3), 239–284.

Gran, H. H. & Braarud, T. (1935). A quantitative study of the phytoplankton in the Bay of Fundy and the Gulf of Maine (including observations on hydrography, chemistry and turbidity). *Journal of the Biological Board of Canada*, *1*(5), 279–467.

Grün, W. & Allemann, F. (1975). The Lower Cretaceous of Caravaca (Spain), Berriasian calcareous nannoplankton of the Miravetes Section (Subbetic zone, Prov. of Murcia). *Eclogae Geologicae Helvetiae*, *68*(1), 147–211.

Grün, W. & Zweili, F. (1980). Das kalkige nannoplankton der Dogger-Malm-Grenze im Berner Jura bei Liesberg (Schweiz). *Jahrbuch Geologischen Bundesanstalt*, *123*, 231–341.

Grzybowski, J. (1898). Otwornice pokładów naftonośnych okolicy Krosna-Foraminifera of oil-bearing strata in the neighbourhood of Krosno. *Rozprawy Wydziału Matematyczno-Przyrodniczego Akademii Umiejętności*, *33*, 257–305.

Hagenow, K. F. v. (1842). Monographie der Rügen'schen Kreide-Versteinerungen. III Abtheilung, Mollusken. *Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefaktenkunde*, *1842*, 528–575.

Hattner, J. G. & Wise, S. W. (1980). Upper Cretaceous calcareous nannofossil biostratigraphy of South Carolina. *South Carolina Geology*, *24*, 41–117.

Haynes, S. J., Huber, B. T., & MacLeod, K. G. (2015). Evolution and phylogeny of mid-Cretaceous (Albian-Coniacian) biserial planktic foraminifera. *Journal of Foraminiferal Research*, *45*(1), 42–81.

Hayward, B. W., Le Coze, F., Vachard, D., & Gross, O. (2018). *World Foraminifera Database*. http//www.marinespecies.org/foraminifera

Herrle, J. O., & Mutterlose, J. (2003). Calcareous nannofossils from the Aptian-Lower Albian of southeast France, palaeoecological and biostratigraphic implications. *Cretaceous Research*, *24*, 1–22.

Hildebrand-Habel, T., Willems, H., & Versteegh, G. J. M. (1999). Variations in calcareous dinoflagellate assemblages from the Maastrichtian to Middle Eocene of the western South Atlantic Ocean (São Paulo Plateau, DSDP Leg 39, Site 356). *Review of Palaeobotany and Palynology*, *106*(1–2), 57–87.

Hill, M. E. (1976). Lower Cretaceous calcareous nannofossils from Texas and Oklahoma. *Palaeontographica Abteilung B, 156*(4–6), 103–179.

Hoffmann, N. (1970a). Coccolithineen aus des Weissen Schreibkreide (Unter - Maastricht) von Jasmund auf. *Geologie*, *19*(7), 846–879.

Hoffmann, N. (1970b). *Placozygus* n. gen. (Coccolithineen) aus der Oberkreide des nordlichen Mitteleuropas. *Geologie*, *19*(8), 1004–1009.

Hofker, J. (1953). Types of Genera Described in Part III of the "Siboga Foraminifera". *The Micropaleontologist*, *7*(1), 26–28.

Hofker, J. (1957). Foraminiferen der Oberkreide von Nordwestdeutschland und Holland. *Beihefte zum Geologischen Jahrbuch*, *27*, 1–464.

Holbourn, A. E. L. & Kaminski, M. A. (1995). Valanginian to Barremian benthic foraminifera from ODP Site 766 (Leg 123, Indian Ocean). *Micropaleontology*, *41*(3), 197–250.

Huber, B. T. & Leckie, R. M. (2011). Planktic foraminiferal species turnover across deep-sea Aptian/Albian boundary sections. *Journal of Foraminiferal Research*, *41*(1), 53–95.

Huber, B. T., Petrizzo, M. R., & Young, J. R. (2020). 'Planoheterohelix olssoni' pforams@mikrotax website. Retrieved October 9, 2020, from http://www.mikrotax.org/pforams/index.php?taxon=Planoheterohelix%20olssoni&module=pf_mesozoic.

Jakubowski, M. (1986). New calcareous nannofossil taxa from the Lower Cretaceous of the North Sea. *International Nannoplankton Assemblage Newsletter*, *8*, 38–42.

Jeremiah, J. (1996). A proposed Albian to Lower Cenomanian nannofossil biozonation for England and the North Sea Basin. *Journal of Micropalaeontology*, *15*(2), 97–129.

Jones, T. R. & Parker, W. K. (1860). On some fossil foraminifera from Chellaston, near Derby. *Quarterly Journal of the Geological Society of London*, *16*, 452–458.

Kaminski, M. A. (1984). Shape variation in *Spiroplectammina spectabilis* (Grzybowski). *Acta Paleontologica Polonica*, *29*, 29–49.

Keller, B. M. (1935). [Microfauna of the Upper Cretaceous in the Dnjepr-Donets valley and some other adjoining regions]. *Bulletin de la Société des naturalistes de Moscou*, *43*(4), 522–558. [in Russian]

Keller, G., Adatte, T., Tantawy, A. A., Berner, Z., Stinnesbeck, W., Stueben, D., & Leanza, H. A. (2007). High stress late Maastrichtian – early Danian palaeoenvironment in the Neuquén Basin, Argentina. *Cretaceous Research*, *28*(6), 939–960.

Kennedy, W. J., Gale, A. S., Bown, P. R., Caron, M., Davey, R. J., Gröcke, D., & Wray, D. S. (2000). Integrated stratigraphy across

the Aptian-Albian boundary in the Marnes Bleues, at the Col de Pre-Guittard, Arnayon (Drome), and at Tartonne (Alpes-de-Haute-Provence), France: a candidate Global Boundary Stratotype Section and Boundary Point for the base of the Albian Stage. *Cretaceous Research*, *21*(5), 591–720

Kielbowicz, A. A., Ronchi, D. I., & Stach, N. H. (1983). Foraminíferos y Ostrácodos Valanginianos de la Formación Springhill, Patagonia Austral. *Revista de la Asociación Geológica Argentina*, *38*(3–4), 313–339.

Köthe, A. (1981). Kalkiges Nannoplankton aus dem Unter-Hauterivum bis Unter-Barremium der Tongrube Moorberg/Sarstedt (Unter-Kreide, NW-Deutschland). *Mitteilungen aus dem Geologischen Institut der Universität Hannover*, *21*, 1–95.

Krasheninnikov, V. A. & Basov, I. A. (1983). Stratigraphy of Cretaceous Sediments of the Falkland Plateau based on planktonic foraminifers, Deep Sea Drilling Project, Leg 71. *Initial Reports of the Deep Sea Drilling Project*, *71*, 789–820.

Lalicker, C. G. (1935). New Cretaceous Textulariidae. *Contributions from the Cushman Laboratory for Foraminiferal Research*, *11*(1), 1–13.

Lamarck, J. B. (1804). Suite des mémoires sur les fossiles des environs de Paris. *Annales du Muséum d'Histoire Naturelle*, *5*, 28–36, 91–98, 179–188, 237–245.

Lamarck, J. B. (1816). Mollusques et Polypes divers. In *Tableau encyclopédique et méthodique des trois règnes de la nature*, (partie 23, pp.1–16). Mme. V. Agasse.

Le Calvez, Y., de Klasz, I., & Brun, I. (1971). Quelques foraminifères de l'Afrique occidentale. *Revista Española de Micropaleontología*, *3*(3), 305–326.

Lescano, M. A. & Concheyro, A. (2009). Nanofósiles calcáreos de la Formación Agrio (Cretácico inferior) en el sector sudoccidental de la Cuenca Neuquina, Argentina. *Ameghiniana*, *46*(1), 73–94.

Linnaeus, C. (1758). *Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Editio decima, reformata, vol. 1.* Laurentius Salvius, Stockholm.

Linnert, C., Mutterlose, J., & Erbacher, J. (2010). Calcareous nannofossils of the Cenomanian/Turonian boundary interval from the Boreal Realm (Wunstorf, northwest Germany). *Marine Micropaleontology*, *74*(1–2), 38–58.

Loeblich, A. R. & Tappan, H. (1950). North American Jurassic Foraminifera, II. Characteristic western interior Callovian species. *Journal of the Washington Academy of Sciences*, *40*, 5–19.

Loeblich, A. R. & Tappan, H. (1986). Some New and Revised Genera and Families of Hyaline Calcareous Foraminiferida (Protozoa). *Transactions of the American Microscopical Society*, *105*(3), 239–265.

Loeblich, A. R. & Tappan, H. (1987). *Foraminiferal genera and their classifications.* Van Nostrand Reinhold.

Loeblich, A. R. & Tappan, H. (1992). Present status of foraminiferal classification. In Y. Takayanagi & T. Saito (Eds.), *Studies in Benthic Foraminifera* (pp. 93–102). Tokai University Press.

Ludbrook, N. H. (1966). Cretaceous biostratigraphy of the Great Artesian Basin in South Australia. *Bulletin of the Geological Survey of South Australia*, *40*, 1–223.

Macfadyen, W. A. (1941). Foraminifera from the Green Ammonite Beds, Lower Lias, of Dorset. *Philosophical Transactions of the Royal Society B, Biological Sciences*, *231*(576), 1–73.

Majzon, L. (1943). Adatok egyes kárpátaljai flisrétegekhez, tekintettel a Globotruncanákra. Beitrage zur Kenntniss einiger Flysch-Schichten des Karpaten-Vorlandes mit Rucksicht auf die Globotruncanen. *A magyar Királyi Földtani Intézet, Évkönyve*, *37*(1), 1–90, 91–169.

Malapris, M. (1965). Les Gavelinellidae et formes affines du gisement Albien de Courcelles (Aube). *Revue de Micropaléontologie*, *8*, 131–150.

Malumián, N. (1968). Foraminíferos del cretácico superior y terciario del subsuelo de la Provincia Santa Cruz, Argentina. *Ameghiniana*, *5*(6), 191–227.

Malumián, N. (1969). First report on fossil nannoplankton from Neuquén, Argentina. *Verhandlungen der Geologische Bundesanstalt*, *3*, 93.

Malumián, N. (1990). Foraminíferos bentónicos del Cretácico de Cuenca Austral. Argentina. In W. Volkheimer (Ed.), *Bioestratigrafía de los Sistemas Regionales del Jurásico y Cretácico de América del Sur* (pp. 429–495). Comité Sudamericano del Jurásico y Cretácico.

Malumián, N. (1999). La sedimentación y el volcanismo terciarios en la Patagonia extraandina. In R. Caminos (Ed.), *Geología Argentina* (Anales 29, pp. 557–612). Instituto de Geología y Recursos Minerales, Servicio Geológico Minero.

Malumián, N. & Caramés, A. (1997). Upper Campanian-Paleogene from the Río Turbio coal measures in southern Argentina, micropaleontology and the Paleocene/Eocene boundary. *Journal of South American Earth Sciences*, *10*(2), 189–201.

Malumián, N., Echevarría, A., Martínez Macchiavello, J., & Náñez, C. (1984). Los Microfósiles. In V. Ramos (Ed.), *Geología y Recursos de la Provincia de Río Negro, Relatorio del noveno Congreso Geológico Argentino* (pp. 485–526). Servicio Geológico Nacional.

Malumián, N., Hromic, T., & Náñez, C. (2013). El Paleógeno de la Cuenca de Magallanes, bioestratigrafía y discontinuidades. *Anales Instituto Patagonia (Chile)*, *41*(1), 29–52.

Malumián, N. & Jannou, G. E. (2010). Los Andes Fueguinos, el registro micropaleontológico de los mayores acontecimientos paleooceanográficos australes del Campaniano al Mioceno. *Andean Geology*, *37*(2), 1–30.

Malumián, N. & Masiuk, V. (1975). Foraminíferos de la Formación Pampa Rincón (Cretácico Inferior), Tierra del Fuego, Argentina. *Revista Española de Paleontología*, *7*(3), 579–600.

Malumián, N. & Masiuk, V. (1976a). Foraminíferos característicos de las formaciones Nueva Argentina y Arroyo Alfa, Cretácico Inferior, Tierra del Fuego, Argentina. *Actas del 6° Congreso Geológico Argentino,* (pp. 393–411). Bahía Blanca.

Malumián, N. & Masiuk, V. (1976b). Foraminíferos de la Formación Cabeza de León (Cretácico superior, Tierra del Fuego, Rep. Argentina). *Revista de la Asociación Geológica Argentina*, *31*(3), 180–202.

Malumián, N. & Masiuk, V. (1978). Foraminíferos planctónicos del Cretácico de Tierra del Fuego. *Revista de la Asociación Geológica Argentina*, *33*(1), 36–51.

Malumián, N. & Náñez, C. (1983). Foraminíferos de ambiente anóxico de la formación Río Mayer (Cretácico inferior), Provincia de Santa Cruz. *Ameghiniana*, *20*(3–4), 367–393.

Malumián, N. & Náñez, C. (1990). Foraminíferos aglutinados del Cretácico Superior de Cuenca Austral (Provincia de Santa Cruz) Argentina. In W. Volkheimer (Ed.), *Bioestratigrafía de los Sistemas Regionales del Jurásico y Cretácico de América del Sur* (pp. 429–496). Comité Sudamericano del Jurásico y Cretácico.

Malumián, N. & Náñez, C. (2011). The Late Cretaceous-Cenozoic transgressions in Patagonia and the Fuegian Andes, foraminifera, palaeoecology, and palaeogeography. *Biological Journal of the Linnean Society*, *103*, 269–288.

Manivit, H. (1965). Nannofossiles calcaires de l'Albo-Aptien. *Revue de Micropaléontologie*, *8*, 189–201.

Manivit, H. (1971). *Nannofossiles calcaires du Crétacé francais (Aptien-Maestrichtien). Essai de Biozonation appuyée sur les stratotypes*. [PhD Thesis, Faculté des Sciences d'Orsay].

Manivit, H., Perch-Nielsen, K., Prins, B., & Verbeek, J. W. (1977). Mid Cretaceous calcareous nannofossil biostratigraphy. *Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen, B80*, 169–181.

Marsson, T. (1878). Die Foraminiferen der weissen Schreibkreide der Insel Rügen. *Mittheilungen aus dem naturwissenschaftlichen Vereine von Neu-Vorpommern und Rügen*, *10*, 115–196.

Martin, L. (1964). Upper Cretaceous and Lower Tertiary foraminifera from Fresno County, California. *Jahrbuch der Geologischen Bundesanstalt*, *9*, 1–128.

Martini, E. & Stradner, H. (1960). Nannotetraster, eine stratigraphisch bedeutsame neue Discoasteridengattung. *Erdöl-Zeitschrift*, *76*, 266–270.

Maslakova, N. I. (1959). Foraminifera. In M. M. Moskvin (Ed.), *Atlas verchnemelovoj fauny severnogo Kavkaza i* Kryma (pp. 87–129). Gosudarstvennoje naučno-techničeskoje izdatel'stvo neftjanoj i gorno-toplivnoj literatury.

Meyn, H. & Vespermann, J. (1994). Taxonomic revision of the Lower Cretaceous foraminifera from SE lower Saxony of Roemer (1839, 1841, 1842), Koch (1851) and Reuss (1863). *Senckenbergiana Lethaea*, *74*(1–2), 49–272.

Montagu, G. (1808). *Testacea Britannica, Supplement*. S. Woolmer.

Monte Guerra, R. do, Concheyro, A., Wise, S. W., Kender, S., & Fauth, G. (2016). New latitude-based nannofossil zonation for the Campanian–Maastrichtian of the South Atlantic Ocean and their paleoceanographic implications. *Palaeogeography, Palaeoclimatology, Palaeoecology*, *452*, 55–67.

Montfort, P. D. de. (1808). *Conchyliologie systématique et classification méthodique des coquilles, Vol. 1.* Schoell.

Morgiel, J. & Olszewska, B. (1981). Biostratigraphy of the polish external carpathians based on agglutinated foraminifera. *Micropaleontology*, *27*(1), 1–30.

Morozova, V. G. (1948). Foraminifery Nizhnemelovykh otlozheniy rayona G. Sochi (yugo-zapadnyy Kavkaz). *Byulettin' Moskovskogo Obshchestva Ispytateley Prirody Otdel Geologischeskii*, *23*(3), 23–43.

Morrow, A. L. (1934). Foraminifera and ostracoda from the Upper Cretaceous of Kansas. *Journal of Paleontology*, *8*(2), 186–205.

Müller, C. (1974). Calcareous nannoplankton, Leg 25 (Western Indian Ocean). *Initial Reports of the Deep Sea Drilling Project*, *25*, 579–633.

Murray, J. W. (1991). *Ecology and paleoecology of benthic foraminifera*. Wiley.

Mutterlose, J. (1992). Lower Cretaceous nannofossil biostratigraphy of northwestern Australia (Leg 123). *Proceedings of the Ocean Drilling Program, Scientific Results*, *123*, 343–368.

Natland, M. L. & Gonzalez P. E. (1974). Geology and Paleontology of Magallanes Basin. In M. L. Natland, P. E. Gonzalez, A. Cañon, & M. Ernst (Eds.), *A System of Stages for Correlation of Magallanes Basin Sediments. Geological Society of American, Memoir 139* (pp. 1–57). The Geological Society of America, Inc.

Natland, M. L., Gonzalez, P. E., Cañon, A., & Ernst M. (1974). *A System of Stages for Correlation of Magallanes Basin Sediments. Geological Society of American, Memoir 139*. The Geological Society of America, Inc.

Noël, D. (1957). Coccolithes des terrains jurassiques de l'Algérie. *Publications du Service de la Carte Géologique de l'Algérie (Nouvelle Série), Bulletin*, *8*, 303–385.

Noël, D. (1958). Étude de coccolithes du Jurassique et du Crétacé inférieur. *Publications du Service de la Carte Géologique de l'Algérie (Nouvelle Série), Bulletin*, *20*, 155–196.

Noël, D. (1965a). Note préliminaire sur des Coccolithes jurassiques. *Cahiers de Micropaléontologie Serie 1*, *1*, 1–12.

Noël, D. (1965b). *Sur les Coccolithes du Jurassique Européen et d'Afrique du Nord.* Editions du Centre National de la Recherche Scientifique.

Noël, D. (1969). *Arkhangelskiella* (coccolithes Crétacés) et formes affines du Bassin de Paris. *Revue de Micropaléontologie*, *11*(4), 191–204.

Noël, D. (1970). *Coccolithes Crétacés, La Craie Campanienne du Bassin de Paris.* Éditions du Centre National de la Recherche Scientifique.

Noël, D. (1973). Nannofossiles calcaires de sédiments jurassiques finement laminés. *Bulletin du Muséum National d'Histoire Naturelle 3e serie*, *75*, 95–156.

Nullo, F. E., Panza, J. L., & Blasco, G. (1999). Jurásico y Cretácico de la Cuenca Austral. In R. Caminos (Ed.), *Geología Argentina* (Anales 29, pp. 528–535). Instituto de Geología y Recursos Minerales, Servicio Geológico Minero.

Ogg, J. G., Ogg, G. M., & Gradstein, F. M. (2016). *A Concise Geologic Time Scale*. Elsevier.

Olivero, E. B. & Malumián, N. (2008). Mesozoic-Cenozoic stratigraphy of the Fuegian Andes, Argentina. *Geologica Acta*, *6*(1), 5–18.

Olsson, R. K. & Usmani, P. A. (1992). Upper Cretaceous foraminifera in Santonian to Maestrichtian depositional sequences in the New Jersey coastal plain. In K. Ishizaki & T. Saito (Eds.), *Centenary of Japanese Micropaleontology* (pp. 301–315). Terra Scientific Publishing Company.

Parker, W. K. & Jones, T. R. (1859). On the nomenclature of the Foraminifera. II. On the species enumerated by Walker and Montagu. *Annals and Magazine of Natural History*, *4*, 333–351.

Parker, W. K. & Jones, T. R. (1863). On the nomenclature of the Foraminifera. VIII. Textularia. *Annals and Magazine of Natural History*, *11*, 91–98.

Parker, W. K. & Jones, T. R. (1865). On some Foraminifera from the North Atlantic and Arctic Oceans, including Davis Straits and Baffin's Bay. *Philosophical transactions of the Royal Society of London*, *155*, 325–441.

Perch-Nielsen, K. (1968). Der Feinbau und die Klassifikation der Coccolithen aus dem Maastrichtien von Dänemark. *Det kongelige Danske Videnskabernes Selskab Biologiske Skrifter*, *16*, 1–93.

Perch-Nielsen, K. (1973). Neue coccolithen aus dem Maastrichtien von Dänemark, Madagaskar und Ägypten. *Bulletin of the Geological Society of Denmark*, *22*, 306–333.

Perch-Nielsen, K. (1979). Calcareous nannofossil zonation at the Cretaceous/Tertiary boundary in Denmark. In T. Birkelund & R. G. Bromley (Eds.), *Proceedings Cretaceous-Tertiary Boundary Events Symposium, Copenhagen* (pp. 115–135). Copenhagen.

Perch-Nielsen, K. (1984). Validation of new combinations. *International Nannoplankton Assemblage Newsletter*, *6*, 42–46.

Perch-Nielsen, K. (1985). Mesozoic calcareous nannofossils. In H. M. Bolli, J. B. Saunders, & K. Perch-Nielsen (Eds.), *Plankton Stratigraphy* (pp. 329–426). Cambridge University Press.

Pérez Panera, J. P. (2010). *Sistemática y Bioestratigrafía de los Nanofósiles Calcáreos del Cretácico del sudeste de la Cuenca Austral, Santa Cruz, Argentina.* [PhD Thesis, Universidad Nacional de La Plata.] Retrieved from http,//hdl.handle.net/10915/35344.

Pérez Panera, J. P. (2011). The calcareous nannofossil *Sollasites falklandensis* (Coccolithophyceae) and its biostratigraphic and Palaeoceanographic importance in the Albian of Austral Basin, Argentina. *Cretaceous Research*, *32*(6), 723–737.

Pérez Panera, J. P. (2012a). Nanofósiles calcáreos y bioestratigra-

fía del Cretácico del sudeste de la Cuenca Austral, Patagonia, Argentina. *Ameghiniana*, *49*(2), 137–163.

Pérez Panera, J. P. (2012b). Two new heterococcoliths from the Albian-Cenomanian, Austral Basin, Patagonia, Argentina. *Journal of Nannoplankton Research*, *32*(2), 75–78.

Pérez Panera, J. P. (2013). Paleogene calcareous nannofossil biostratigraphy for two boreholes in the eastern Austral Basin, Patagonia, Argentina. *Andean Geology*, *40*(1), 117–140.

Pérez Panera, J. P. (2019). Distribution of *Micula murus* in the Late Maastrichtian soutwestern Atlantic Ocean and its contribution to palaeoceanographic reconstructions. *Abstracts of the 17th International Nannoplnakton Assemblage Meeting* (p. 83). Santos.

Pérez Panera, J. P. & Angelozzi, G. N. (2006). Nanofósiles calcáreos del Cretácico tardío - Terciario, del Pozo BB III A x-1 (Bahía Blanca), Cuenca del Colorado, Argentina. *Ameghiniana*, *43*(3), 557–565.

Pérez Panera, J. P., Parra, F. J., Navarrete, R. E., Sánchez, C., Daza, D., Rodríguez, M., & Prince, M. (2019). Turonian-Santonian calcareous nannofossil biozonation for La Luna Formation, Middle Magdalena Valley Basin, Northern Colombia. In G. C. Cusminsky, E. Bernasconi, & G. A. Concheyro (Eds.), *Advances in South American Micropaleontology. Selected Papers of the 11th Argentine Paleontological Congress* (pp. 46–66). Springer International Publishing.

Pérez Panera, J. P., Ronchi, D. I., Angelozzi, G. N., Lovecchio, J. P., Calvo Marcilese, L., Hiriart, M. L., Tórtora, L., Calaramo, N., & Cuciniello, C. D. (2018). [Argentine offshore integrated biostratigraphic and paleoenvironmental analysis, Synthesis of the Colorado Basin. Y-TEC Internal Report, p. 1–71.]

Perlmutter, N. M. & Todd, R. (1965). Correlation and Foraminifera of the Monmouth Group (Upper Cretaceous), Long Island, New York. *United States Geological Survey Professional Paper*, *483*(1), 1–24.

Peroni, G., Cagnolatti, M., & Pedrazzini, M. (2002). Cuenca Austral, Marco geológico y reseña histórica de la actividad petrolera. In M. Schiuma, G. Hinterwimmer, & G. Vergani (Eds.), *Rocas reservorio de las cuencas productivas de la Argentina* (pp. 1–20). Instituto Argentino del Petróleo y el Gas.

Pessagno, E. A. (1967). Upper Cretaceous planktonic foraminifera from the western Gulf Coastal Plain. *Palaeontographica Americana*, *5*, 245–445.

Petters, S. W., El-Nakhal, H. A., & Cifelli, R. L. (1983). *Costellagerina*, a new Late Cretaceous globigerine foraminiferal genus. *Journal of Foraminiferal Research*, *13*(4), 247–251.

Piveteau, J. (1952). *Traité de paléontologie*, *Vol 1*. Masson.

Plummer, H. J. (1927). Foraminifera of the Midway formation in Texas. *University of Texas Bulletin*, *2644*, 1–206.

Plummer, H. J. (1931). Some Cretaceous foraminifera in Texas. *University of Texas Bulletin*, *3101*, 109–203.

Rahman, A. & Roth, P. H. (1992). New calcareous nannofossil taxa of Jurassic and early Cretaceous age from the Oka River region in Central Russia. *Neues Jahrbuch für Geologie und Paläontologie Abhandlungen*, *184*, 251–277.

Ramos, V. A. (2002). Evolución tectónica. In M. J. Haller (Ed.), *Geología y recursos naturales de la provincia de Santa Cruz* (pp. 365–390). Asociación Geológica Argentina.

Reinhardt, P. (1964). Einige Kalkflagellaten-Gattungen (Coccolithophoriden, Coccolithineen) aus dem Mesozoikum Deutschlands. *Monastberichte der Deustchen Akademie der Wissenschaften zu Berlin*, *6*, 749–759.

Reinhardt, P. (1965). Neue Familien für fossile Kalkflagellaten (Coccolithophoriden, Coccolithineen). *Monatsberichte der Deutschen Akademie der Wissenschaften zu Berlin*, *7*, 30–40.

Reinhardt, P. (1966a). Zur Taxionomie und Biostratigraphie des fossilen Nannoplanktons aus dem Malm. der Kreide und dem Alttertiär Mitteleuropas. *Freiberger Forschungshefte C*, *196*, 5–109.

Reinhardt, P. (1966b). Fossile Vertreter coronoider und styloider Coccolithen (Family Coccolithaceae Poche 1913). *Monatsberichte der Deutschen Akademie der Wissenschaften zu Berlin*, *8*, 513–524.

Reinhardt, P. (1967). Fossile Coccolithen mit rhagoidem Zentralfeld (Fam. Ahmuellerellaceae, Subord. Coccolithineae) *Neues Jahrbuch für Geologie und Paläontologie, Monatshefte*, *1967*, 163–178.

Reinhardt, P. (1970). Synopsis der Gauttungen und Arten der mesozoischen Coccolithen und anderer kalkiger Nannofossilien. I, II. *Freiberger Forschungshefte*, *C260*, 5–32; *C265,* 41–111.

Reinhardt, P. (1971). Synopsis der Gauttungen und Arten der mesozoischen Coccolithen und anderer Kalkiger Nannofossilien, Teil III. *Freiberger Forschungshefte*, *C267*, 19–41.

Reinhardt, P. & Górka, H. (1967). Revision of some Upper Cretaceous Coccoliths from Poland and Germany. *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, *129*, 240–256.

Reiss, Z. (1959). The Wall-Structure of Cibicides, Planulina, Gyroidinoides, and Globorotalites. *Micropaleontology*, *5*(3), 355–357.

Reuss, A. E. (1844). *Geognostische Skizzen aus Böhmen. II. Kreidegebilde des westlichen Böhmens* (vol. 2). C.W. Medau.

Reuss, A. E. (1845). *Die Versteinerungen der böhmischen Kreideformation. Erste Abtheilung*. E. Schweizerbart'sche Verlagsbuchhandlung und Druckerei.

Reuss, A. E. (1846). *Die Versteinerungen der böhmischen Kreideformation. Zweite Abtheilung*. E. Schweizerbart'sche Verlagsbuchhandlung und Druckerei.

Reuss, A. E. (1850). Neue Foraminiferen aus den Schichten des österreichischen Tertiärbeckens. *Denkschriften der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschafliche Classe*, *1*, 365–390.

Reuss, A. E. (1851). Die Foraminiferen und Entomostraceen des Kreidemergels von Lemberg. *Naturwissenschaftliche Abhandlungen Wien*, *4*, 17–52.

Reuss, A. E. (1860). Die Foraminiferen der westphälischen Kreideformation. *Sitzungsberichte der mathematisch-naturwissenschaflichen Classe der kaiserlichen Akademie der Wissenschaften*, *40*(8), 147–238.

Reuss, A. E. (1862). Entwurf einer systematischen Zusammenstellung der Foraminiferen. *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe. Abt. 1, Mineralogie, Botanik, Zoologie, Anatomie, Geologie und Paläontologie*, *44*(1), 355–396.

Reuss, A. E. (1863). Die Foraminiferen des norddeutschen Hils und Gault. *Kaiserliche Akademie der Wissenschaften Wien*, *46*, 5–100.

Revets, S. A. (1996). The generic revision of five families of Rotaliine Foraminifera - Part 2. The Anomalinidae, Alabaminidae, Cancrisidae & Gavelinellidae. *Cushman Foundation for Foraminiferal Research, Special Publication*, *34*(2), 57–113.

Risatti, J. B. (1973). Nannoplankton biostratigraphy of the Upper Bluffport Marl-Lower Prairie Bluff Chalk interval (upper Cretaceous) in Mississippi. In L. A. Smith & J. Hardenbol (Eds.), *Proceedings of the Symposium on Calcareous Nannofossils. Gulf Coast Section, Society for Sedimentary Geology Special Publication* (pp. 8–57). SEPM Publication.

Risso, A. (1826). *Histoire naturelle des principales productions de l'Europe Méridionale et particulièrement de celles des environs de Nice et des Alpes Maritimes*. F.G. Levrault.

Robaszynski, F., Caron, M., Amedro, F., Dupuis, C., Hardenbol, J., Gonzalez Donosos, J. M., Linares, D., & Gartner, S. (1993). Le Cénomanien de la région de Kalaat Senan (Tunisie centrale), Litho-biostratigraphie et interprétation séquentielle. *Revue de Paléobiologie*, *12*(2), 351–505.

Robbiano, J. A., Arbe, H. A., & Gangui, A. (1996). Cuenca Austral Marina. In V. A. Ramos, & M. A. Turic (Eds.), *Geología y Recursos Naturales de la Plataforma Continental Argentina. Relatorio del 13° Congreso Geológico Argentino y 3° Congreso de Exploración de Hidrocarburos* (pp. 323–341). Asociación Geológica Argentina.

Rodríguez, J. F. & Miller, M. (2005). Cuenca Austral. In G. A. Chebli, J. S. Cortiñas, L. A. Spalletti, L. Legarreta, & E. L. Vallejo (Eds.), *Frontera Exploratoria de la Argentina* (pp. 307–323). Instituto Argentino del Petróleo y del Gas.

Roemer, F. A. (1839). *Die Versteinerungen des norddeutschen Oolithen-Gebirges. Ein Nachtrag*. Hahn'sche Hofbuchhandlung.

Roemer, F. A. (1841). *Die Versteinerungen des norddeutschen Kreidegebirges*. Hahn'sche Hofbuchhandlung.

Romein, A. J. T. (1977). Calcareous nannofossils from the Cretaceous/Tertiary boundary interval in the Barranco del Gredero (Caravaca, Prov. Murcia, S.E. Spain). *II. Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen*, *B80*, 269–279.

Romein, A. J. T. (1979). Lineages in early Paleogene calcareous nannoplankton. *Utrecht Micropaleontological Bulletins*, *22*, 1–230.

Ronchi, D. & Angelozzi, G. (1994). Bioestratigrafía de Cretácico-Terciario en dos pozos ubicados al oeste de la Cuenca Austral. *Boletín de Informaciones Petroleras*, *39*, 65–76.

Rood, A. P., Hay, W. W., & Barnard, T. (1971). Electron Microscope Studies of Oxford Clay Coccoliths. *Eclogae Geologicae Helvetiae*, *64*, 245–272.

Rutledge, D. & Bown, P. R. (1996). New names for old: taxonomic clarification of some Early Cretaceous nannofossil marker-species. *Journal of Nannoplankton Research*, *18*, 53–59.

Rzehak, A. (1885). Bemerkungen über einige Foraminiferen der Oligocän Formation. *Verhandlungen des Naturforschenden Vereins in Brünn*, *23*, 123–129.

Sachse, V. F., Strozyk, F., Anka, Z., Rodríguez, J. F., & Primio, R. di. (2015). The tectono-stratigraphic evolution of the Austral Basin and adjacent areas against the background of Andean tectonics, southern Argentina, South America. *Basin Research*, *28*(4), 462–482.

Sastry, N. V. A. & Sastri, V. V. (1966). Foraminifera from the Utatur Stage of the Cretaceous Formations of Trichinopoly District, Madras. *Records of the Geological Survey of India*, *94*(2), 277–296.

Scheibnerová, V. (1974). Aptian-Albian Benthonic Foraminifera from DSDP Leg 37, Sites 259, 260, and 263, Eastern Indian Ocean. *Initial Reports of the Deep Sea Drilling Project*, *27*, 697–741.

Scheibnerová, V. (1978). Aptian and Albian Benthic Foraminifers of Leg 40, Sites 363 and 364, Southern Atlantic. *Initial Reports of the Deep Sea Drilling Project*, *40*, 741–757.

Schubert, R. J. (1912). Über die Verwandtschaftsverhältnisse von Frondicularia. *Verhandlungen der Geologischen Reichsanstalt, Wien*, *1912*, 179–184.

Schultze, R. E. (1875). Zoologische Ergebnisse der Nordseefahrt, vom 21 Juli bis 9 September, 1872. I, Rhizopoden. II. In H. A. Meyer, K. Möbius, G. Karsten, V. Hensen, & C. Kupffer (Eds.), *Jahresberichte Kommission zur Untersuchung der Deutschen Meer in Kiel für die Jahr 1872, 1873* (pp. 99–114). Wiegand, Hempel & Parey.

Shafik, S. & Stradner, H. (1971). Nannofossils from the Eastern Desert, Egypt. *Jahrbuch der Geologischen Bundesanstalt, Sonderband*, *17*, 69–104.

Silvestri, A. (1903). Linguloglanduline e Lingulonodosarie. *Atti della Pontificia Accademia Romana dei Nuovi Lincei*, *56*, 45–50.

Silvestri, A. (1904). Ricerche strutturali su alcune forme dei Trubi dei Bonfornello (Palermo). *Memorie dell'Accademia Pontificia dei Nuovi Lincei*, *22*, 235–276.

Sissingh, W. (1977). Biostratigraphy of Cretaceous calcareous nannoplankton, *Geologie en Mijnbouw*, *56*, 37–65

Sliter, W. V. (1968). Upper Cretaceous Foraminifera from Southern California and Northwestern Baja California, Mexico. *University of Kansas Paleontological Contributions*, *49*, 1–141.

Stache, G. (1864). Die Foraminiferen der tertiären Mergel des Whaingaroa-Hafens (Provinz Auckland). *Reise der Österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859 unter den Befehlen des Commodore B. von Wüllerstorf-Urbair. Paläontologie von Neu-Seeland, Beiträge zur Kenntniss der fossilen Flora und Fauna der Provinzen Auckland und Nelson. Novara-Expedition, Geologischer Theil*, *1*(2), 159–304.

Stover, L. E. (1966). Cretaceous coccoliths and associated nannofossils from France and the Netherlands. *Micropaleontology*, *12*, 133–167.

Stradner, H. (1959). Die Fossilen Discoasteriden Österreichs. II. Teil. *Erdöel-Zeitschrift*, *75*, 472–488.

Stradner, H. (1961). Vorkommen von Nannofossilien im Mesozoikum und Alttertiär. *Erdoel-Zeitschrift*, *77*(3), 77–88.

Stradner, H. (1962). Über neue und wenig bekannte Nannofossilien aus Kreide und Alttertiär. *Sonderabdruck aus den Verhandlungen der Geologischen Bundesanstalt*, *2*, 363–377.

Stradner, H. (1963). New contributions to Mesozoic stratigraphy by means of nannofossils. *Proceedings of the Sixth World Petroleum Congress* (pp. 167–183). Frankfurt.

Stradner, H., Adamiker, D., & Maresch, O. (1968). Electron microscope studies on Albian calcareous nannoplankton from the Delft 2 and Leidschendam 1 deepwells, Holland. *Verdhandelingen der Koninklijke Nederlanse Akadamie van Wetenschappen, Afd. Natuurkunde*, *24*, 1–107.

Stradner, H. & Steinmetz, J. (1984). Cretaceous calcareous nannofossils from the Angola Basin, Deep Sea Drilling Project Site 530. *Initial Reports of the Deep Sea Drilling Project*, *75*, 565–649.

Tappan, H. (1940). Foraminifera from the Grayson Formation of northern Texas. *Journal of Paleontology*, *14*(2), 93–126.

Terquem, O. (1862). Recherches sur les Foraminifères du Lias. Second Mémoire. *Mémoires de l'Académie Impériale de Metz*, *42*, 415–466.

Terquem, O. (1883). Sur un nouveau genre de foraminifères de Fuller's-earth de la Moselle. *Bulletin de la Société Géologique de France*, *3*(11), 37–39.

Thibault, N., Gardin, S., & Galbrun, B. (2010). Latitudinal migration of calcareous nannofossil *Micula murus* in the Maastrichtian, implications for global climate change. *Geology*, *38*, 203–206.

Thierstein, H. R. (1971). Tentative Lower Cretaceous Calcareous Nannoplankton Zonation. *Ecogae Geologicae Helvetiae*, *64*, 459–488.

Thierstein, H. R. (1973). Lower Cretaceous calcareous nannoplankton biostratigraphy. *Abhandlungen der Geologischen Bundesanstalt*, *29*, 1–52.

Thierstein, H. R. (1974). Calcareous nannoplankton - Leg 26, Deep Sea Drilling Project. *Initial Reports of the Deep Sea Drilling Project*, *26*, 619–667.

Toulmin, L. D. (1941). Eocene smaller Foraminifera from the Salt Mountain limestone of Alabama. *Journal of Paleontology*, *15*(6), 567–611.

Varol, O. (1989). Quantitative analysis of the *Arkhangelskiella cymbiformis* Group and Biostratigraphic usefulness in the North Sea Area. *Journal of Micropaleontology*, *8*(2), 131–134.

Varol, O. (1992). Taxonomic revision of the Polycyclolithaceae and its contribution to Cretaceous biostratigraphy. *Newsletter on Stratigraphy*, *27*(3), 93–127.

Varol, O. & Girgis, M. (1994). New taxa and taxonomy of some Jurassic to Cretaceous calcareous nannofossils. *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, *192*, 221–253.

Vekshina, V. N. (1959). Coccolithophoridae of the Maastrichtian deposits of the West Siberian Lowlands. *Siberian Science Research Institute of Geology, Geophysics, Mineralogy and Raw Materials*, *2*, 56–81.

Verbeek, J. W. (1976). Upper Cretaceous nannoplankton zonation in a composite section near El Kef, Tunisia. *Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen*, *B79*, 129–148

Verbeek, J. W. (1977). Calcareous nannoplankton biostratigraphy of Middle and Upper Cretaceous deposits in Tunisia, southern Spain and France. *Utrecht Micropaleontological Bulletins*, *16*, 1–157.

Vincent, P., Grosjean, A. S., Bert, D., Ferreira, J., Suchéras-Marx, B., Suan, G., Guinot, G., Perrier, V., Janneau, K., Brazier, J. M., Sarroca, E., Guiomar, M., & Martin, J. E. (2020). Paleoenvironmental context and significance of a partial elasmosaurid skeleton from the Albian of Haute-Provence, France. *Cretaceous Research*, *108*. http://doi.org/10.1016/j.cretres.2019.104293.

Voloshina, A. M. (1969). Vidy semeystva Chilostomellidae (Foraminifery) iz Verkhnemelovykh otlozheniy Volyno Podolii. *Palaeontologicheskiy Sbornik, L'vov*, *6*(1), 3–10.

Watkins, D. K., Wise, S. W., Pospichal, J. J., & Crux, J. A. (1996). Upper Cretaceous calcareous nannofossil biostratigraphy and paleoceanography of the Southern Ocean. In A. Moguilevsky & R. Whatley (Eds.), *Microfossils and Oceanic Environments* (pp. 355–381). Aberystwyth Press.

Williams-Mitchell, E. (1948). The zonal value of foraminifera in the Chalk of England. *Proceedings of the Geologists' Assemblage*, *59*(2), 91–112.

Wind, F. H. & Čepek, P. (1979). Lower Cretaceous calcareous nannoplankton from DSDP Hole 397A (northwest African Margin). *Initial Reports of the Deep Sea Drilling Project*, *47*, 221–235.

Wind, F. H. & Wise, S. W. (1983). Correlation of Upper Campanian-Lower Maastrichtian calcareous nannofossil assemblages in drill and piston cores from the Falkland Plateau, Southwest Atlantic Ocean. *Initial Reports of the Deep Sea Drilling Project*, *71*, 551–563.

Wise, S. W. (1983). Mesozoic and Cenozoic calcareous nannofossils recovered by DSDP Leg 71 in the Falkland Plateau region, Southwest Atlantic Ocean. *Initial Reports of the Deep Sea Drilling Project*, *71*, 481–550.

Wise, S. W. & Wind, F. H. (1977). Mesozoic and Cenozoic calcareous nannofossils recovered by DSDP Leg 36 drilling on the Falkland Plateau, south-west Atlantic sector of the Southern Ocean. *Initial Reports of the Deep Sea Drilling Project*, *36*, 269–491.

Worsley, T. R. (1971). Calcareous nannofossil zonation of Upper Jurassic and Lower Cretaceous sediments from the Western Atlantic. In A. Farinacci (Ed.), *Proceedings of the Second Planktonic Conference, Roma 1970* (pp. 1301–1321). Edizioni Tecnoscienza.

Wright, J. (1875). A list of the Cretaceous microzoa of the north of Ireland. *Proceedings Belfast Naturalists' Field Club*, *1*(3), 73–99.

Young, J. R. & Bown, P. R. (1997). Higher Classification of calcareous nannofossils. *Journal of Nannoplankton Research*, *19*(1), 15–20.

doi: 10.5710/PEAPA.24.09.2020.342

Recibido: 8 de mayo 2020
Aceptado: 24 de septiembre 2020
Publicado: 9 de diciembre 2020