

Perisphinctes orbigny n. sp. and accompanying perisphinctid assemblage from the Lower Oxfordian (Cordatum Zone, Cordatum Subzone) in southern Poland (Zalas, Krakow region)

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Abstract – The paper presents preliminary characteristics of a new perisphinctid assemblage from the Lower Oxfordian section of Zalas near Krakow, regarded as the classic one for southern Poland. The assemblage is derived from strata of the Cordatum Subzone, Cordatum Zone. Two major groups of perisphinctids are differentiated. The assemblage appears similar to those described by Neumann from Cetechowicz [12], Bourseau from ‘Terres noires’ of de Beauvoisin in France [2], and Gygi from Switzerland [9]. It fills very well a gap in our knowledge of this fauna from upper parts of the Lower Oxfordian and further studies should make it possible to propose and define a new biostratigraphic unit. A new ammonite species *Perisphinctes (Arisphinctes?) orbigny* n. sp. is described. Its name is given to commemorate the bicentenary of the birth of Alcide d’Orbigny and his contribution to the developments of stratigraphy of the Mesozoic, especially Jurassic strata. **To cite this article:** R. Tarkowski, C. R. Palevol 1 (2002) 689–695. © 2002 Académie des sciences / Éditions scientifiques et médicales Elsevier SAS

Oxfordian / Perisphinctids / southern Poland / d’Orbigny

Résumé – *Perisphinctes orbigny* n. sp. et l’assemblage de périsphinctidés de l’Oxfordien inférieur (Zone à Cordatum, Sous-zone à Cordatum) du Sud de la Pologne (Zalas, région de Cracovie). Cet article présente une description préliminaire d’un nouvel assemblage de périsphinctidés du gisement de Zalas, près de Cracovie, appartenant à la série classique de l’Oxfordien inférieur du Sud de la Pologne. Cet assemblage provient de la Zone à Cordatum, Sous-zone à Cordatum, où ont été distingués deux groupes de périsphinctidés. L’ensemble décrit présente des ressemblances avec celui décrit par Neumann à Cetechowicz [12], par Bourseau dans les « Terres noires », par de Beauvoisin en France [2] et par Gygi en Suisse [9]. Il vient ainsi combler le manque de données sur les périsphinctidés de la partie supérieure de l’Oxfordien inférieur et permettra, dans le futur, d’identifier une nouvelle unité biostratigraphique. La description d’une nouvelle espèce d’ammonites est présentée : *Perisphinctes (Arisphinctes?) orbigny* n. sp. Le nom de l’espèce est dédié à la mémoire d’Alcide d’Orbigny à l’occasion de la commémoration du 200^e anniversaire de sa naissance et de sa contribution au développement des connaissances sur la stratigraphie du Mésozoïque, plus particulièrement du Jurassique. **Pour citer cet article :** R. Tarkowski, C. R. Palevol 1 (2002) 689–695. © 2002 Académie des sciences / Éditions scientifiques et médicales Elsevier SAS

Oxfordien / périsphinctidés / Sud de la Pologne / d’Orbigny

Version abrégée

1. Introduction

La présence de lacunes et de condensations stratigraphiques sont l’une des caractéristiques principales des coupes de

l’Oxfordien inférieur européen. Pour cette raison, les ammonites et plus particulièrement celles des couches de la Sous-zone à Cordatum (Zone à Cordatum) sont très mal identifiables. Dans ce contexte, la coupe de l’Oxfordien inférieur et moyen de Zalas fait exception à la règle, puisqu’elle est l’une des plus classiques et des plus complètes

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de l'Oxfordien inférieur de Pologne, voire d'Europe [19]. Plus de 250 espèces de fossiles d'invertébrés marins ont été décrites dans cette région. Sur la liste des espèces mises en évidence, plusieurs dizaines d'entre elles ont été décrites pour la première fois par A. d'Orbigny.

La carrière de Zalas, située à 25 km à l'ouest de Cracovie (Fig. 1), renferme des couches lenticulaires de marno-calcaires de couleur gris-vert, appelées « couche verte ». Ces couches renferment de nombreux fossiles d'ammonites et de bélemnites [14, 15, 18, 19]. Elles représentent la partie inférieure de la Sous-zone à Cordatum, position confirmée par la présence de plusieurs cardioceratidés [11], ainsi que par la position stratigraphique des couches au sein du profil des formations de l'Oxfordien inférieur.

Il est à noter la participation active des géologues français dans les recherches stratigraphiques et paléontologiques de l'Oxfordien inférieur de cette région [1, 10, 11, 20].

De nombreux périsphinctidés de la « couche verte » de Zalas n'ont pas encore fait l'objet d'études paléontologiques détaillées. Le présent article donne les caractéristiques préliminaires d'un nouvel assemblage de périsphinctidés de ce gisement et décrit une espèce nouvelle. La description détaillée d'autres espèces est en cours de préparation.

2. Caractéristique du groupe des périsphinctidés

Les périsphinctidés, groupe dominant dans la « couche verte », représentent environ 40% de l'ensemble des ammonites. Ce groupe se caractérise par une présence faible de côtes à bifurcation basse. La morphologie des échantillons permet de distinguer deux groupes :

- des spécimens semblables à ceux de la Zone à Claromontanus [4];
- des spécimens se rapprochant de ceux observés dans l'horizon à *paturattensis* [4] et dans la Zone à *Plicatilis* [7].

L'assemblage des périsphinctidés de la couche verte de Zalas présente une grande similitude avec l'ensemble d'ammonites décrit par Neumann à Cetechowiz [12], par Bourseau dans les « Terres noires » de Beauvoisin en France [2] et par Gygi dans le canton d'Aargau en Suisse [9].

L'assemblage ainsi documenté provient de couches de position stratigraphique bien définie. Cet assemblage, d'une grande particularité, est également d'une grande originalité. Se basant sur les périsphinctidés, Brochwicz-Lewiński [4] a distingué, dans les formations de l'Oxfordien inférieur de Pologne, la Zone à Claromontanus, et plus en dessus, l'horizon à *paturattensis*. Cet auteur a aussi fait remarquer la présence de lacunes stratigraphiques au sein des coupes des formations de l'Oxfordien inférieur, ainsi que le manque de

données sur ce groupe d'ammonites. L'assemblage (Fig. 3) pourrait dans le futur caractériser une nouvelle unité biostratigraphique qui, sur la base des périsphinctidés, pourrait combler la lacune biostratigraphique de l'Oxfordien inférieur.

3. Nouvelle espèce dédiée à Alcide d'Orbigny :

Perisphinctes (Arisphinctes?) orbignyi n. sp.

Perisphinctes (Arisphinctidés?) orbignyi n. sp. [M]

Derivatio nominis. Dédiée à Alcide d'Orbigny à l'occasion de la commémoration du 200^e anniversaire de sa naissance et de sa contribution au développement de la stratigraphie du Mésozoïque et plus particulièrement du Jurassique.

Diagnose. Coquille macroconque de 300 mm de diamètre, avec ouverture conservée. La loge d'habitation occupe 80% du dernier tour de spire ; elle présente une section ovale, avec une paroi ombilicale verticale et profonde. La partie ventrale, sans côtes, est peu marquée. Les côtes primaires de la loge d'habitation sont massives, proverses, et présentent une forme cylindrique.

Affinités. L'espèce décrite présente de grandes ressemblances avec *Perisphinctes (Arisphinctes)* sp. A [M] de Gygi [9] et avec *P. (Arisphinctes) healeyi* NEUMANN [12]. La classification de l'espèce décrite dans le genre *Arisphinctes* est discutable. *Perisphinctes (Arisphinctes)* sp. A [9], plus proche de l'espèce décrite ici, a été classée par Gygi dans le sous-genre *Arisphinctes*. Le sous-genre *Arisphinctes*, tout comme le *Dichotomosphinctes*, observé à partir de la Zone à *Plicatilis* de l'Oxfordien moyen, se présente en grand nombre dans la Zone à *Transversarium* [7, 8]. La présence sporadique de fossiles du sous-genre *Arisphinctes* dans la Zone à *Cordatum* peut s'expliquer par le fait que le matériel récolté à ce jour représente les tours internes, les spécimens adultes étant rarement conservés (remarque de G. Melendez), ou bien par le fait que les spécimens adultes sont souvent de petite taille [5].

4. Conclusion

En raison des lacunes et des condensations stratigraphiques des formations de l'Oxfordien inférieur, la coupe des affleurements de Zalas appartient, à la série classique à l'échelle européenne. La « couche verte » de Zalas est particulièrement intéressante (Zone à *Cordatum*, partie inférieure de la Sous-zone à *Cordatum*). Elle constitue, en effet, un inestimable gisement de fossiles, principalement d'ammonites, qui avaient fait déjà l'objet de recherches des paléontologues polonais et français.

1. Introduction

1.1. Classical section of the Oxfordian from the Krakow area

Lower and Middle Oxfordian strata exposed in the vicinities of Zalas and Krzeszowice, Krakow area

(Poland), have been well known for many years to be especially rich in fossils. Already by the end of 19th century, the material gathered from these strata made it possible for Bukowski [6] and Siemiradzki [13] to describe numerous new species of invertebrates, especially ammonites, and, along with further studies the

Lower Oxfordian sections from this area, began to be recognized as classic for the European region [19].

The studies on these strata made it possible to describe over 250 species of fossil marine invertebrates (sponges, brachiopods, gastropods, ammonites, belemnites and echinoids). It should be emphasized here that the list of species recorded in the Zalas section includes representatives of over a dozen species of *A. d'Orbigny*. These are ammonite species – *Goliathiceras goliathum* (D'ORBIGNY), *Holcophylloceras zignodianum* (D'ORBIGNY), *Lissoceratoides erato* (D'ORBIGNY), *Quenstedtoceras mariae* (D'ORBIGNY), *Neocampylites henrici henrici* (D'ORBIGNY), *Parawedekindia arduenensis* (D'ORBIGNY), *Peltoceratoides constantii* (D'ORBIGNY), *Sowerbyceras tortisulcatum* (D'ORBIGNY), *Trimarginites eucharis* (D'ORBIGNY); belemnite species – *Belemnopsis latesulcatus* (D'ORBIGNY), *Cylindroteuthis puzosiana* (D'ORBIGNY), *Pachyteuthis pandariana* (D'ORBIGNY), *Pseudobelus coquandus* (D'ORBIGNY), *Rhopaloteuthis sauvanai* (D'ORBIGNY) and brachiopod species – *Gallienithyris gallieni* (D'ORBIGNY) and *Terebratella loricata* (D'ORBIGNY).

1.2. Location and stratigraphic position of the studied ammonite fauna

The studied strata represent lenticular bodies of green-gray calcareous marls full of ammonites and belemnites, occurring within a packet of Lower Oxfordian marls and marly limestones exposed in the quarry at Zalas, 25 km west of Krakow (Fig. 1). The strata rest on yellow to red marls of the Bukowskii Subzone of the Cordatum Zone and are overlain by grey spongy marls and marly limestones which are interpreted as transitional beds from the Lower Oxfordian (Cordatum Zone, Cordatum Subzone, *elizabethae* horizon) to Middle Oxfordian (Plicatilis Zone, Tenuicostatum Subzone, *zalasiense* horizon) [15, 18, 19] (Fig. 2).

The ammonite assemblage from the Green Bed of Zalas represents lower part of the Cordatum Subzone. This dating is based on records of numerous cardioceratids, especially *Cardioceras cordatum* (SOWERBY), *C. asthonense* ARKELL, *C. persecans* (BUCKMAN) [11, 15] and some other characteristic species, as well as the stratigraphic position of this bed in the Lower Oxfordian section.

1.3. The results of previous studies

The green-grey marly beds, known as the Green Bed of Zalas, were subject of intense studies by Polish and French geologists since the beginning of the 1980s. A special attention should be paid to the role of French geologists in recognition of stratigraphic gaps at the boundary between the Lower and Middle Oxfordian in

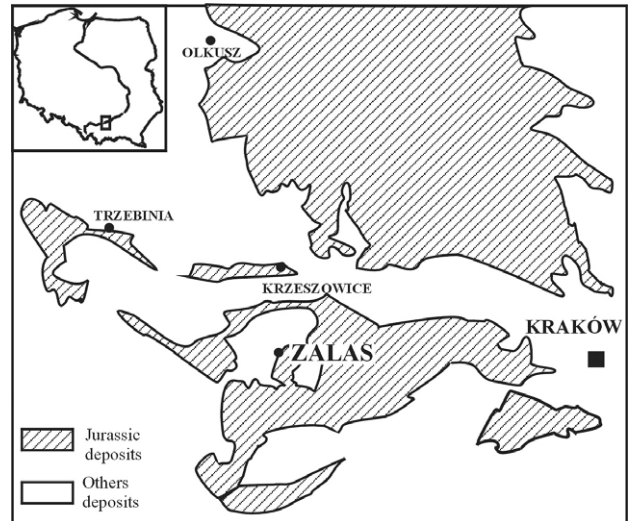


Fig. 1. Distribution of the Jurassic outcrops in the vicinities of Krakow.

Fig. 1. Localisation des formations du Jurassique dans la région de Cracovie.

several sections in the Polish Jura Chain, including that from Zalas [10], and initiating a new phase in the studies of macrofossils of the Oxfordian in the Krakow region (southern Poland). Results of these studies were presented in a number of palaeontological and stratigraphic papers [1, 11, 14–16, 20]. The studies showed that sediments yielding the fossil assemblage from the Green Bed of Zalas were accumulated in a relatively short time interval, that is, during one biohorizon. Special attention should be paid to the results of synevolutionary analysis of ammonites of the families Aspidoceratidae, Cardioceratidae, Oppeliidae and Perisphinctidae, found in this bed. The analysis showed

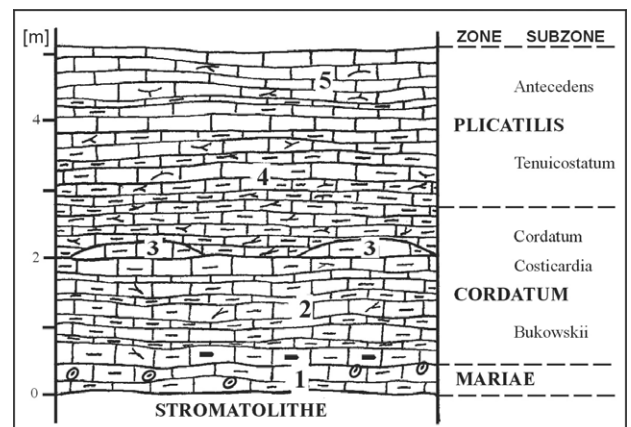


Fig. 2. Stratigraphic section of the Lower and Middle Oxfordian at Zalas.

Fig. 2. Coupe stratigraphique des formations de l'Oxfordien inférieur et moyen de Zalas.

that morphological differentiation of representatives of some ammonite genera should not be interpreted as a result of condensation of the fauna, but rather as an intraspecific variability [11]. Analysis of well-preserved representatives of the genera *Mirosphinctes* and *Euaspidoceras*, carried out by Bonnot et al. [1], showed that we might be dealing here with a dimorphic pair.

Attention should be also paid to traces of imprints of epifauna found on some moulds of ammonite body chambers. These imprints show continuation of growth of epifaunal organisms after the death of the ammonite [15, 16]. Taxonomical and taphonomical analyses of fossil assemblage of the Green Bed made it possible to evaluate shares of representatives of individual groups as well to define their preservation, the distribution and position of these fossil remains in sediment. Taphonomic analysis showed that any long-distant transport of these fossils might be excluded and that the individual ammonite assemblages appear fairly uniform which gives further support to the high rates of sedimentation of this layer [15].

1.4. Major goals of the studies

In Europe, Lower Oxfordian ammonites, especially those of the Costicardia and Cordatum Subzones of the Cordatum Zone are still poorly known, because of widespread gaps and stratigraphic condensations in the studied sections. The studies carried out in the last two decades have shown that the section exposed in the Zalas quarry belongs to the most complete and, therefore, may be used as a reference section for further studies in Poland and other parts of Europe [19].

The studies gave a relatively rich collection of perisphinctids from the Green Bed at Zalas. The material gathered, dated well by the co-occurring cardioceratids and *Taramelliceras* and other ammonites, may greatly help in filling gaps in our knowledge of the evolution of this group. Intense palaeontological studies on these perisphinctids have been initiated in recent years and this article presents preliminary characteristics of the recorded assemblage and description of one new species. Detailed palaeontological descriptions of other taxa are being prepared.

2. The characteristics of the perisphinctid assemblage

Ammonite spectra obtained for the Green Bed from the Zalas section show that the share of perisphinctids is about 40%, so it may be stated that this group predominates in the recorded ammonite assemblage. The available material comprises numerous micro- and

macroconchs. The major feature of the fauna is scarcity of individuals with low point of ribs bifurcation.

Two major groups may be differentiated on the basis of morphological features:

- specimens resembling forms of the Claromontanus Zone of the Cześćochowa area [4];
- specimens close to morphologies occurring in the *paturattensis* horizon [4] as well as in the Plicatilis Zone [7].

The first group is represented by numerous specimens. These are mainly microconchs assignable to the *Perisphinctes mayrei-mathei* group. They are characterised by flattened whorls and ribs more loosely spaced and coarser, which brings them close to the species *Prososphinctes consociatus* BUKOWSKI.

The second group is represented by micro- and macroconchs, characterised by wide umbilicus, ribs slightly bent backwards, strongly rounded inner whorls, and numerous well-developed parabolic nodes and constrictions. They match diagnosis of the subgenus *Otosphinctes* and appear close to representatives of *P. montfalconensis* LORIOI, *P. episcopalis* LORIOI or *P. paturattensis* LORIOI. Macroconchs are found to be generally poorly preserved. A part of the specimens with whorls rounded in cross-section, appear close to *P. rotoides* RONCHADZE., whereas those with whorls almost quadrate in cross-section resemble *P. antecessens* SALFELD. The material also comprises specimens with wide and deep umbilicus, rounded whorls and ribs bent strongly forward and occasionally trifurcate, which may be treated as close to *P. (Kranaosphinctes) promiscus* BUKOWSKI [3]. The majority of specimens display only occasional ribs with point of furcation situated below the mid-height of the flanks.

The perisphinctid assemblage recorded in the Green Bed of Zalas should be treated as important, owing to the fact that it still remains unknown from other parts of the country. The assemblage appears very similar to those described from Cetechowicz in Slovakia by Neumann [12], from ‘Terres noires’ in the Beauvoisin region of France by Bourseau [2] and from the Aargau canton in Switzerland by Gygi [9].

Ammonites described by Neumann [12] were found mainly in so-called layer ‘b’ – a horizon of grey-green knobby marly sediments very rich in fossils, forming an intercalation in sandstone series of the Silesian Unit of the Carpathian Mts, cropping out in a locality near Bratislava. It should be noted here that the layer ‘b’ appears to be quite similar to the Green Bed of Zalas. The similarities include ammonite spectra, lithology of sediments, wealth of fossils, the mode of preservation of ammonites (inner moulds with one side destroyed) and stratigraphic position. Attention should be also paid

MEDITERRANEAN PROVINCE				BOREAL PROVINCE		
ZONES	Subzones	Horizonts	Zones	Horizonts	Subzones	ZONES
PATURATTENSIS (POPANITES)	Paturattensis	?	?	Cordatium	Cordatium	CORDATUM
	Oculatum			Costicardia	Costicardia	
MINAX	Baccatum	Mazuricus	Claromontanus	Bukowskii	Bukowskii	CORDATUM
		Claromontanus				
	Spixi	?	?	Praecordatium	Praecordatium	MARIAE
				Alphacordatium		
				Praemartini	Scarburgense	
				Woodhamense		
	Scarburgense					
		Elisabethae (Peltoceratoides)				
Taramelliceratine		Perisphinctaceae		Cardioceratidae		

Fig. 3. Correlation of biostratigraphic subdivisions of the Lower Oxfordian of the Mediterranean and Boreal provinces (after [7]) and stratigraphic position of perisphinctid assemblage from the Green Bed from Zalas. Left column: subdivision on the basis of *Taramelliceratinae* (after [17]).

Fig. 3. Corrélation des divisions biostratigraphiques de l'Oxfordien inférieur des provinces Méditerranéenne et Boréale [7] ; à gauche : division sur la base de *Taramelliceratinae* [17] et position stratigraphique marquée du groupe des périsphinctidés de la couche verte de Zalas.

to presence of perisphinctids characterized by low point of furcation, that is similar in ribbing to those from collections of Bourseau [2] as well as Gygi [9].

The perisphinctid assemblage from Zalas above described is derived from layers with precisely defined stratigraphic position as the co-occurring fauna made it possible to date it at lower part of the Cordatum Subzone of the Cordatum Zone. The assemblage appears original and easy to distinguish from older and younger ones.

It should be noted that, on the basis of results of studies carried out with Marchand and Brochwicz-Lewiński [10] and our discussions, Brochwicz-Lewiński [4] presented an attempt to extend perisphinctid zonation downwards to the Lower Oxfordian. He differentiated the Claromontanus Zone (as an equivalent to the Bukowskii Zone) and the Episcopalis/Paturattensis Zone (an equivalent to the Vertebrale Zone), accepted with some modifications in zonation for western European and Mediterranean Europe as proposed by Cariou et al. [7]. It should be added that thanks to the above-mentioned studies with Marchand, Brochwicz-Lewiński [4] was fully aware of stratigraphic gaps in the Lower Oxfordian section of southern Poland and, therefore, of the knowledge of this group of ammonites. Perisphinctids from the Green Bed of Zalas fill very well one of these gaps if the studied assemblage is dated at the Cordatum Subzone in the cardioceratid zonation (Fig. 3). Therefore, it should be possible to define a new perisphinctid-based biostratigraphic unit usable for dating Lower Oxfordian strata in areas where cardioceratids are missing or scarce.

3. The new species dedicated to Alcide d'Orbigny: *Perisphinctes (Arisphinctes?) orbignyi* n. sp.

Perisphinctes (Arisphinctes?) orbignyi n. sp. [M]

See Fig. 4.

Holotype: Tables 1 (Zoological Museum of Jagiellonian University, No. 15883).

Type locality: Quarry at Zalas near Krakow.

Type lithologic horizon: Green Bed.

Age: Lower Oxfordian, Cordatum Zone, Cordatum Subzone.

Derivation of the name: to commemorate bicentenary of birth of Alcide d'Orbigny and his contribution to the developments in stratigraphy of Phanerozoic rocks, especially the Jurassic.

Material: one complete fully grown specimen.

Diagnosis: complete macroconch with aperture preserved, 300 mm in diameter; body chamber occupying about 80% of the last whorl, high ovate in cross-section, with high vertical umbilical wall; ventral side poorly marked, smooth; body chamber ornamented with fairly uniform primary ribs, ridge-shaped and markedly bent forwards.

Description: mould preserved only from one side in marly limestone layer, displaying complete body chamber, the body chamber beginning at a diameter of 208 mm to end with peristome of diameter 300 mm; inner whorls ovate in cross-section, thicker than high, weakly overlapping one another, especially in the case



Fig. 4. *Perisphinctes orbignyi* n. sp.: holotype from the Green Bed of Zalas (Zoological Museum of Jagiellonian University, Krakow, No. 15883).

Fig. 4. *Perisphinctes orbignyi* n. sp. : holotype de la couche verte de Zalas (musée de Zoologie de l'université des Jagellon à Cracovie, n° 15883).

of more external ones; umbilicus wide, with wall vertical and high at outer whorls, generally lower at inner whorls.

Inner whorls ornamented with regular well-developed rib, beginning on the umbilical margin, slightly prorsiradiate, bifurcating close to ventral margin. First order ribs with point of furcation situated low on the whorl side are occasionally found.

From the diameter of 130 mm onwards, ribs of the first order become thicker, better pronounced, and more distant from one another. They divide into secondaries close to the ventral margin. Ventral side of the penultimate whorl ornamented with secondary ribs similarly oriented but less well marked as primary ribs. Intercalaries are occasionally found.

The body chamber occupying three-quarters of the last whorl, weakly overlapping the penultimate one,

with whorl section high ovate, higher than that of inner whorls. Ribs regular, strong, in the form of thick ridges, strongly bent forwards. Ventral side rounded, poorly marked, smooth. The last half of whorl ornamented with 18 thick, strongly prorsiradiate ribs.

Dm:– 300 mm, Wh: 70 mm, Wt: 46 (?) mm, Um: 185 mm. Ur/whorl: 175–47; 157– 50, 145–52.

Affinities: the above-described species resembles *Perisphinctes* (*Arisphinctes*) sp. A [M], recently described by Gygi [9 (p. 21, pl. 6, fig. 1, text-fig. 16, table 13)], differing from the latter in wider umbilicus and accordingly a more loose coiling of whorls. The species from Zalas also appears somewhat similar to *P.* (*Arisphinctes*) *healeyi* NEUMANN, differing in more strongly marked primary ribs, wider umbilicus and lower point of bifurcation of ribs.

It is still an open question whether or not the new species may be assigned to the subgenus *Arisphinctes*, in which Gygi [9] placed the possibly most closely related species *Perisphinctes (Arisphinctes)* sp. A [9] mentioned above. The record of representatives of this subgenus (similarly as those of the subgenus *Dichotomosphinctes*) may be treated as continuous from the Plicatilis Zone of the Middle Oxfordian, to become especially common in the Transversarium Zone [7, 8].

Scarcity of material referable to that genus in strata of the Cordatum Zone may be due to failures in collecting of complete and fully grown large-size individuals due to the above mentioned gaps and condensations (G. Melendez, pers. comm.) or to a general trend in the reduction of size of ammonites, assumed by Brochwicz-Lewiński and Różak [5] at the turn of the Cordatum and Plicatilis Zones.

4. Conclusions

Because of the omnipresence of gaps and stratigraphic condensations in Lower Oxfordian sections in several parts of Europe, the section from Zalas begins to be recognised as a classic one. The studies on strata cropping out at Zalas made it possible to find representatives of over 250 species of fossil invertebrates, including over a dozen of d'Orbigny's species. A

special attention should be paid to the so-called Green Bed of Zalas, dated at lower part of the Cordatum Subzone of the Cordatum Zone, which gave rich fossil fauna, especially ammonites, which were the subject of intense studies of Polish and French palaeontologists.

The paper presents preliminary characteristics of a new perisphinctid assemblage, including a new species *Perisphinctes orbignyi* n. sp., coming from the Green Bed. Two groups of perisphinctids have been differentiated: one characterized by forms close to those of the Claromontanus Zone, and the other, more numerous, comprising forms resembling those known from the Paturattensis horizon of the Middle Oxfordian. The assemblage displays similarities to those described by Neumann from Cetechowicz, Bourseau from 'Terres noires' of Beauvoisin in France, and Gygi from Aargau canton in Switzerland. The assemblage fills very well a gap in our knowledge of evolution of this group of fauna and further studies should make it possible to define and propose a new biostratigraphic unit for the Lower Oxfordian.

The above-described new ammonite species, *Perisphinctes orbignyi* n. sp., was named in order to commemorate the bicentenary of the birth of Alcide d'Orbigny and his contribution to the developments of stratigraphy of the Phanerozoic, especially the Jurassic.

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