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Oxfordian ammonite genus *Passendorferia* Brochwicz-Lewiński, 1973, from Malaga (Subbetic Zone, Spain)

ABSTRACT: The representatives of the ammonite genus *Passendorferia* Brochwicz-Lewiński, 1973, are described from the Oxfordian (Upper Jurassic) strata cropping out between El Torcal de Antequera and Cañete la Real in Malaga (Subbetic Zone, Spain). The collected forms are assigned to the classic Spanish species *P. torcalense* (Kilian), two Polish species *P. teresiformis* Brochwicz-Lewiński and *P. zieglerei* Brochwicz-Lewiński, and to the new species *P. brochwiczi* sp. n.

INTRODUCTION

The ammonite subfamily Idoceratinae Spath, 1924, of the family Perisphinctidae Steinmann, 1890, comprises taxa typical of the Upper Jurassic Mediterranean province. The best known of them, *Idoceras* Burckhardt, 1906, and *Nebroditis* Burckhardt, 1912, did not appear before the Late Oxfordian in that region (Sequeiros, 1974a) but at present there are known some Middle Oxfordian specimens displaying all the features characteristic of the subfamily Idoceratinae Spath. For these specimens a separate subgenus *Passendorferia* of the genus *Nebroditis* was proposed by Brochwicz-Lewiński (1973). The taxon *Passendorferia* was subsequently treated as a full genus by Enay (1976) and Supanoy (1976) which seems much better solution because of still unclear relations between the last *Passendorferia* and first *Idoceras* and *Nebroditis* proper (see also Brochwicz-Lewiński & Rózak, 1976). The representatives of *Passendorferia* appear to be fairly common in the Middle Oxfordian of Poland, France, Romania (Brochwicz-Lewiński, 1973), Spain (Sequeiros, 1974a, b), Bulgaria (Supanov, 1976), Sicily, North Africa and Turkey (Enay, 1976)*. The paper presents Spanish repre-

* The recent report on the subject comes also from Switzerland (Gygi, 1977).

representatives of that genus which were formerly assigned to *Perisphinctes* (*Arisphinctes*) by Cruz Sanjulian & al. (1973) and to both this subgenus and *Nebrodites* (*Passendorferia*) by the author (Sequeiros, 1974b). The earlier records are revised and some new data given. Only macroconchiate forms are discussed here and the microconchs will be dealt with in subsequent paper.

INTERPRETATION OF THE MATERIAL

The collection studied comprises 50 specimens about 25 of which are sufficiently preserved for identification and taking measurements. In descriptions the following abbreviations are used: *D* — shell diameter, *U* — umbilical diameter, *H* — whorl height, *T* — whorl thickness, and *r:D* — number of primary ribs at a given diameter.

Family *Perisphinctidae* Steinmann, 1890

Subfamily *Idoceratinae* Spath, 1924

Genus *PASSENDORFERIA* Brochwicz-Lewiński, 1973

Type species: *Nebrodites* (*Passendorferia*) *terestiformis* Brochwicz-Lewiński (1973)

Passendorferia torcalense (Kilian, 1889)

(Text-figs 1—2, 6 and Pl. 1)

1889. *Simoceras torcalense* Kilian; Kilian, p. 629, Pl. 25, Fig. 6.

1974b. *Perisphinctes* (*M. Arisphinctes*) *torcalense* Kilian; Sequeiros, p. 165, Pl. 16, Fig. 3 [only].

Material: Four specimens. Body chamber is nowhere complete but one phragmocone displays approximated septa.

Dimensions (see Table 1).

Table 1
Dimensions of *Passendorferia torcalense* (Kilian)

	D	U	H	T	U:D	H:D	T:D	T:H	r:D
Holotype	137	80	30	-	0.58	0.22	-	-	74:137
	110	61	26	-	0.55	0.24	-	-	78:110
	90	49	23	-	0.54	0.26	-	-	88:90
									84:70
									77:60
KH1/R/34	/150/	86	34	29	0.57	0.23	0.20	0.85	38:150
	135	70	34	28	0.52	0.25	0.21	0.82	73:135
	100	49	32	-	0.49	0.32	-	-	86:100
	75	25	23	-	0.47	0.31	-	-	88:80
	33	17	9	-	0.51	0.27	-	-	84:70
									72:50
									65:40
KH1/R/38	133	72	33	25	0.54	0.25	0.19	0.76	
	105	58	28	20	0.55	0.27	0.19	0.72	
	80	43	19	-	0.54	0.24	-	-	
KH1/R/50	130	68	34	23	0.52	0.26	0.17	0.68	71:130
	100	50	29	21	0.50	0.29	0.21	0.73	78:100
	75	40	23	18	0.53	0.31	0.24	0.79	75:90
	45	22	13	-	0.49	0.29	-	-	73:60

Description. — Shell evolute, over 180 mm in size. Umbilicus very wide, shallow. Whorls slowly increasing in height, at first subcircular, later subrectangular. Ventral area convex, ventral margin broadly rounded. Ribs crowded, sharp-crested, straight or slightly prorsiradiate, thin except for some swellings on ventral margin, broken on the venter or not. Rib curve revealing a marked decrease in density of ribs towards the peristome. Inner and middle whorls with deep, somewhat prorsiradiate, wide constrictions delineated by slightly oblique, thick ribs or lips disturbing ribbing; the constrictions are about 300° distant from one another so there are always two of them on every complete whorl.

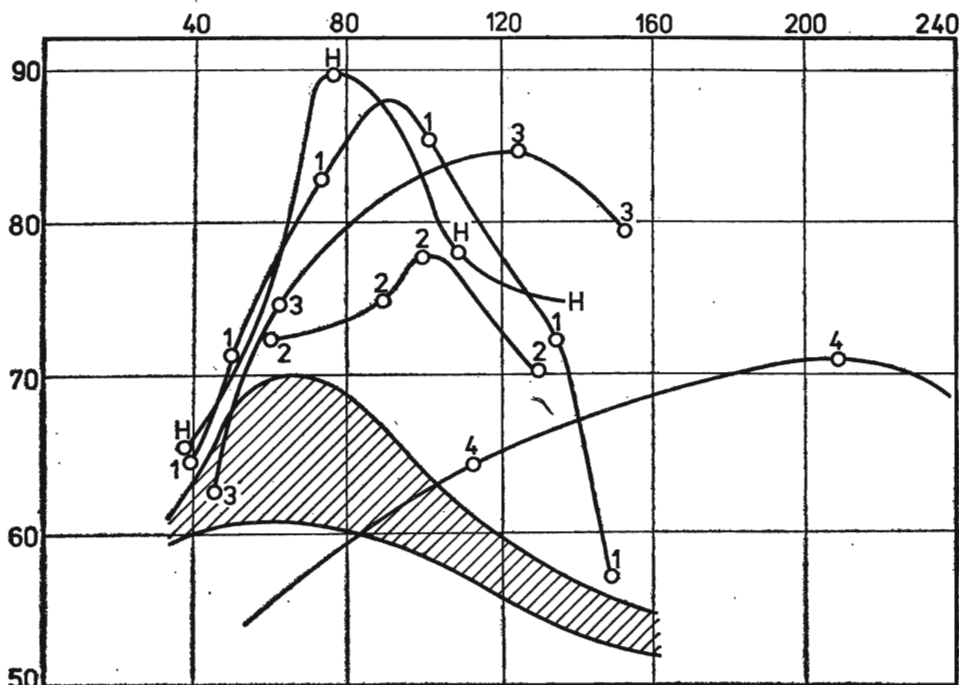


Fig. 1. Rib curves of:

Passendorferia torcalense (Kilian): 1 — KH1/R/34, 2 — KH1/R/50; H — holotype; *Perisphinctes (Arisphinctes) tenuis* Enay: 3 — holotype (after Enay, 1966); *P. (Arisphinctes) plicatilis* (Sowerby): 4 — holotype (after Enay, 1966); *Passendorferia zieglerei* Brochwicz-Lewiński, 5 — holotype (after Brochwicz-Lewiński, 1973)

The umbilical diameter/shell diameter ratio increasing along with shell growth from less than 0.50 for inner whorls to about 0.60 for the outer. Rib curve is highly specific as the number of ribs increases from 72–77 on 50–60 mm diameter to 78–88 at 90–100 mm diameter and rapidly decreases to 38 at the end of the phragmocone.

The suture is very similar to that of *Perisphinctes (Arisphinctes)* and may be described as N larger than $L = E$.

Remarks. — Kilian (1889) assigned his specimen to the genus *Stimoceras* Zittel, 1870, on account of ventral smooth band and similarity to Gemmellaro's (1875) species, and created a new species on account of ribs more crowded and coarser than in other species of that genus. The specimens described here are derived from the same horizons of the Oxfordian of Malaga as the holotype.

Similar forms were recently described from the Torcal de Antequera as *Perisphinctes bocconi* Gemmellaro by Peyre (1974). They differ, however, from the representatives of *Passendorferia torcalense* (Kilian) in the style of ribbing.

The specimens here assigned to *Passendorferia* were previously assigned by the author (Sequeiros, 1974b) to the subgenus *Perisphinctes* (*Arisphinctes*) on account of similarity of suture lines.

Occurrence. — The species *Passendorferia torcalense* (Kilian) is common in the Middle Oxfordian of El Torcal de Antequera and Canete la Real (Malaga, Subbetic Zone) where it is accompanied by *Gregoryceras foquei* (Kilian). Well-preserved specimens were found near Valle de Abdalajis in Sierra de Huma (Sequeiros, 1974a).

Passendorferia zieglerei Brochwicz-Lewiński, 1973

(Text-figs 2, 6; Pl. 2 and Pl. 3, Fig. 3)

Table 2
Dimensions of *Passendorferia zieglerei* Brochwicz-Lewiński

	D	U	H	T	U:D	H:D	T:D	T:H	r:D	
Holotype	270	162	60	-	0.60	0.22	-	-	56:162 62:120 72:80	71:60 68:50 62:35
KH1/11/1	220	135	47	44	0.61	0.21	0.22	0.94	71:220	74:115
	185	110	40	37	0.59	0.22	0.20	0.93	69:185	77:90
	150	85	40	-	0.57	0.27	-	-	70:150	68:55
	115	65	28	-	0.57	0.24	-	-		
	90	50	24	-	0.56	0.27	-	-		
KH1/19/1	162	90	36	32	0.55	0.22	0.19	0.89	58:162	65:70
	140	73	34	-	0.52	0.24	-	-	63:140	63:60
	100	53	23	-	0.53	0.23	-	-	65:100 70:80	59:45
KH3/R/4	160	90	38	32	0.56	0.24	0.20	0.84	62:160	63:60
	105	55	25	-	0.52	0.24	-	-	69:105	
	60	33	-	-	0.55	-	-	-		
KH1/19/3	115	63	27	-	0.55	0.23	-	-	72:115 72:100	68:75 45:42
KH1/12/1	138	74	32	-	0.53	0.23	-	-	60:79	
KT5/9/1	185	105	42	37	0.52	0.26	0.20	0.88	57:185	65:70
	140	75	35	-	0.54	0.25	-	-	61:160 64:140	61:60 52:45
	100	52	29	-	0.52	0.29	-	-	70:100	
KT5/R/1	195	113	45	-	0.58	0.23	-	-	61:190	69:90
	163	92	39	-	0.56	0.24	-	-	64:165	64:65
	120	62	32	-	0.52	0.27	-	-	70:150	60:50
	100	52	30	-	0.52	0.30	-	-	73:120	58:35
FJG/T31	160	90	38	32	0.56	0.24	0.20	0.84	62:160	53:60
	105	55	25	-	0.52	0.24	-	-	69:105	
KH6/R/1	145	85	35	-	0.59	0.24	-	-	66:145	63:55
	115	64	29	-	0.55	0.25	-	-	70:100 72:80	56:33

1973. *Nebroditis (Passendorferia) zieglerti* sp. n.; Brochwicz-Lewiński, p. 311, Text-figs 2-3, Pls. 15-18 and Pl. 22, Fig. 3.
 1974b. *Perisphinctes (M. Arisphinctes) plicatilis* (Sowerby); Sequeiros, p. 160 [pars], Pl. 18, Fig. 2 [non Pl. 17, Fig. 2].
 1974b. *Perisphinctes (M. Arisphinctes) helenae* de Riaz; Sequeiros, p. 163 (pars) [non Pl. 14, Fig. 2].
 1976. *Passendorferia zieglerti* Brochwicz-Lewiński; Sapunov, p. 39.
 1977. *Passendorferia zieglerti* Brochwicz-Lewiński; Gygi, p. 443.

Material: Ten specimens.

Dimensions (see Table 2).

Description. — Spanish representatives of this species are characterized by highly evolute coiling and attain over 220 mm in size. Umbilicus very large, shallow. Whorls very slowly increasing in height, initially subcircular in outline, later subrectangular with rounded ventral and umbilical margins; venter flattened and smooth.

Primary ribs straight, relatively regular, becoming somewhat flattened on ventral margin and disappearing on the venter. Constrictions deep, prorsiradial, wide, delineated by thick ribs or lips somewhat oblique and disturbing the ribbing.

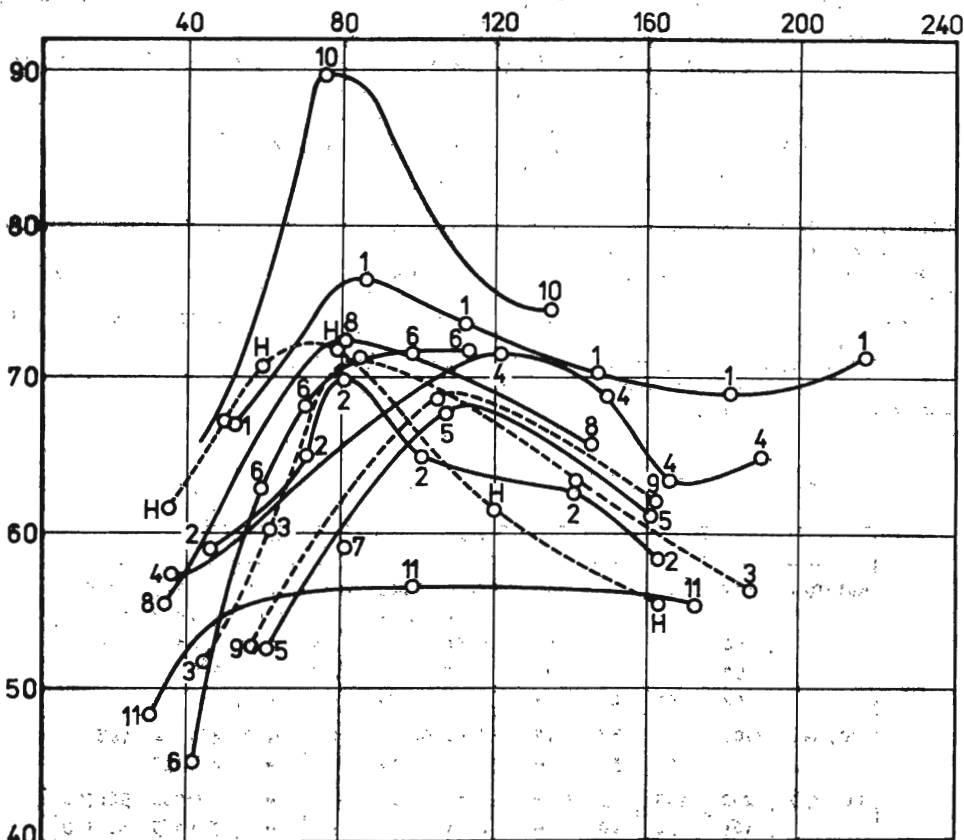


Fig. 2. Rib curves of:

Passendorferia zieglerti Brochwicz-Lewiński: 1 — KH1/11/1, 2 — KH1/19/1, 3 — KT8/9/1, 4 — KT5/R/1, 5 — KH3/R/4, 6 — KH1/19/3, 7 — KH1/12/1, 8 — KN6/R/1, 9 — FJG/T51/74, H — holotype (after Brochwicz-Lewiński, 1973)

P. torcalense (Kilian): 10 — holotype;

P. teresiformis Brochwicz-Lewiński: 11 — holotype (after Brochwicz-Lewiński, 1973).

The constrictions are marked at every 300° on outer and middle whorls so there are always two of them on every complete whorl.

The umbilical diameter/shell diameter ratio generally steadily increases along with shell growth. It is not lower than 0.50 for inner whorls and sometimes exceeds 0.60 for the outer.

A large number of specimens gathered made possible analysis of changes in ribbing. The maximum density of ribs coincides with 80—100 mm shell diameter (65—75 ribs per whorl) and further increase in shell size is connected with gradual decrease in number of ribs. It may be noted that the initial part of rib curve (up to 80 mm shell diameter) is much steeper than that following the peak in density of ribbing.

Remarks. — The species *Passendorferia zieglerei* Brochwicz-Lewiński was proposed on the basis of 4 almost complete Polish specimens characterized by relatively large shell size, highly evolute coiling, elliptical whorl section as well as a fairly regular shape of rib curves with the maximum (65—75 ribs per whorl) coinciding with 60—80 mm shell diameter. This species differs from *P. teresiformis* Brochwicz-Lewiński in larger size, more rounded whorl section and ribs generally more crowded and finer. It differs from *P. torcalense* (Kilian) in more rounded whorl section and less densely spaced ribs.

Occurrence. — Found together with *Passendorferia torcalense* (Kilian) in the Gregoryceras foquei horizon of the upper Middle Oxfordian in Malaga area.

Passendorferia teresiformis Brochwicz-Lewiński, 1973
(Text-figs 3—4, 6; Pl. 3, Figs 1—2 and Pl. 4, Fig. 1)

1973. *Nebroditis* (*Passendorferia*) *teresiformis* sp. n.; Brochwicz-Lewiński, p. 304, Text-figs 2—3, Pl. 13 and Pl. 14, Fig. 3.

1974b. *Nebroditis* (*M. Passendorferia*) sp. 1; Sequeiros, p. 204, Text-fig. II-92, Pl. 17, Fig. 1.

1974b. *Nebroditis* (*M. Passendorferia*) sp. 2; Sequeiros, p. 206, Text-fig. II-93.

1974b. *Pertsphinctes* (*M. Arisphinctes*) *helenae* de Riaz; Sequeiros, p. 163 [pars], Text-fig. II-83, Pl. 14, Fig. 2.

1976. *Passendorferia teresiformis* Brochwicz-Lewiński; Sapunov, p. 30.

Material: Three, well preserved specimens.

Dimensions (see Table 3).

Table 3
Dimensions of *Passendorferia teresiformis* Brochwicz-Lewiński

	D	U	H	T	U:D	H:D	T:D	T:H	r:D
KBL/R/13	147	87	34	28	0.59	0.23	0.19	0.82	48:147 47:65
	127	73	22	32	0.58	0.25	0.20	0.69	48:127 45:55
	108	60	28	21	0.56	0.24	0.19	0.75	50:100 38:45
	97	55	22	19	0.57	0.23	0.19	0.86	49:80
	82	45	20	-	0.55	0.29	-	-	
KBL/14/3	/185/	115	37	27	0.62	0.195	0.145	0.73	49: 185
	135	78	32	-	0.58	0.24	-	-	46:135
KT5/R/2	200	115	45	-	0.57	0.26	-	-	51:200 56:120
	164	92	40	-	0.56	0.25	-	-	52:165 60:100
	100	56	28	-	0.56	0.23	-	-	54:120 56:80

Description. — Spanish representatives of this species are characterized by fairly evolute coiling and attain up to 200 mm in size. Umbilicus very wide and shallow. Whorls very slowly increasing in size, subrectangular in outline. Ribs

relatively loosely-spaced, straight, coarse and somewhat flattened on ventral margin and fading out on the venter. Constrictions the same as in *P. zieglerei* Brochwicz-Lewiński. The U/D ratio always exceeding 0.55 and even 0.62 for

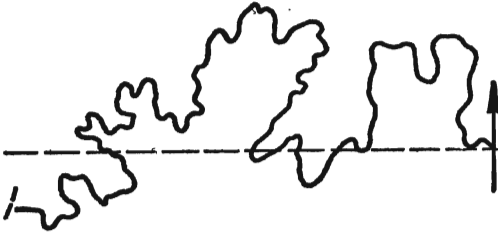


Fig. 3
Suture line of *Passendorferia teresiformis* Brochwicz-Lewiński (specimen No. KH1/R/18)

outer whorls. The maximum shell size is unknown. One of the Spanish specimens could have exceeded 250 mm in size. The phragmocone diameter of another Spanish specimen is equal 185 mm so it may be assumed that its original diameter was also equal about 250 mm or even somewhat more.

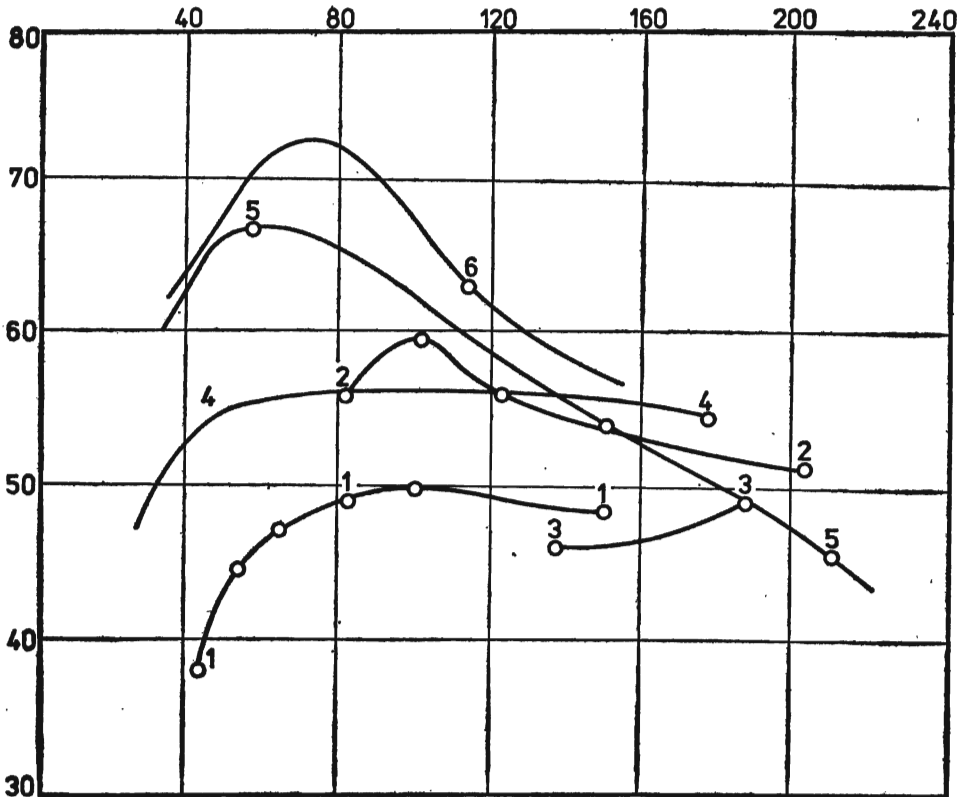


Fig. 4. Rib curves of:
Passendorferia teresiformis Brochwicz-Lewiński: 1 — KH1/R/13, 2 — KT5/R/2,
3 — KH1/14/3, 4 and 5 — holotype and paratype, respectively (after Brochwicz-
Lewiński, 1973);
P. zieglerei Brochwicz-Lewiński: 6 — holotype (after Brochwicz-Lewiński, 1973)

Rib curves of the Spanish specimens, similarly as those of the Polish ones (see Brochwicz-Lewiński, 1973, Text-fig. 2), reflect fairly high intraspecific variability. The Spanish specimens generally seem closer to the paratype (cf. Brochwicz-Lewiński, 1973, p. 309, Pl. 14, Fig. 3) than the holotype of the species.

Remarks. — The species *Passendorferia terestiformis* Brochwicz-Lewiński comprises a series of specimens characterized by highly evolute coiling, very wide umbilicus, markedly subrectangular section and flat sides of outer whorls. It differs from *P. zieglerei* Brochwicz-Lewiński in generally smaller shell size and less dense and coarser ribbing as well as in more rectangular whorl section, and from *P. torcalense* (Kilian) in much more coarse and less dense ribbing.

Occurrence. — In Malaga area the same as that of *Passendorferia torcalense* (Kilian) and *P. zieglerei* Brochwicz-Lewiński.

Passendorferia brochwiczi sp. n.
(Text-figs 5—6 and Pl. 4, Fig. 2)

1974b. *Nebrodites* (*M. Passendorferia*) sp. 4; Sequeiros, p. 208, Text-figs II-94, II-95, and Pl. 16, Fig. 2.

Holotype: The specimen No. KN5/R/3, figured in Pl. 4, Fig. 2.

Type locality: El Torcal de Antequera, Malaga area, Subbetic Range, Spain.

Type horizon: Gregoriyceras foquei horizon, upper Middle Oxfordian.

Derivation of the name: In honour of Dr. W. Brochwicz-Lewiński, the student of Jurassic ammonite fauna.

Material: The holotype.

Dimensions (see Table 4).

Table 4
Dimensions of *Passendorferia brochwiczi* sp. n.

	D	U	H	T	U:D	H:D	T:D	T:H	r:D	
KN5/R/3	185	102	45	38	0.55	0.24	0.21	0.85	47:185	58:60
/140/		77	35	30	0.55	0.25	0.22	0.86	-	61:32
	154	85	37	33	0.55	0.24	0.22	0.89	60:154	
	130	72	32	29	0.55	0.25	0.22	0.91	63:130	
	117	65	32	-	0.55	0.27	-	-	69:117	
	100	55	27	-	0.55	0.27	-	-	59:100	

Diagnosis: Coiling highly evolute; outer whorls subrectangular in outline, with flat sides. Ribs, initially crowded, more loosely spaced on inner whorls, crowded once more close to the end of the phragmocone and becoming very loosely spaced and swollen thereafter; the changes in ribbing are reflected by two peaks on rib curve (see Text-fig. 5).

Description. — A single well-preserved specimen with the subperistomal part of the last whorl broken off. The *U/D* ratio is roughly constant throughout the development. Whorls initially somewhat rectangular and low, with flat sides and concave venter, becoming progressively more and more compressed later. Ribs initially crowded, sharp-crested and fine, straight or somewhat prorsiradate. On middle whorls they are more loosely spaced, coarser, somewhat swollen on ventral margin and broken on the venter, becoming crowded once more close to the end of the phragmocone. The second crowding is followed by a rapid change in the style of ribbing as the ribs become very loosely spaced, markedly swollen, and prorsiradate, thickened on ventral margin and fading out on the

venter on the body chamber. The changes in ribbing are reflected by two distinct peaks on the rib curve (see Text-fig. 5).

The original size of the specimen is estimated at about 200 mm. The phragmocone diameter equals 140 mm and the body chamber is a whorl long.

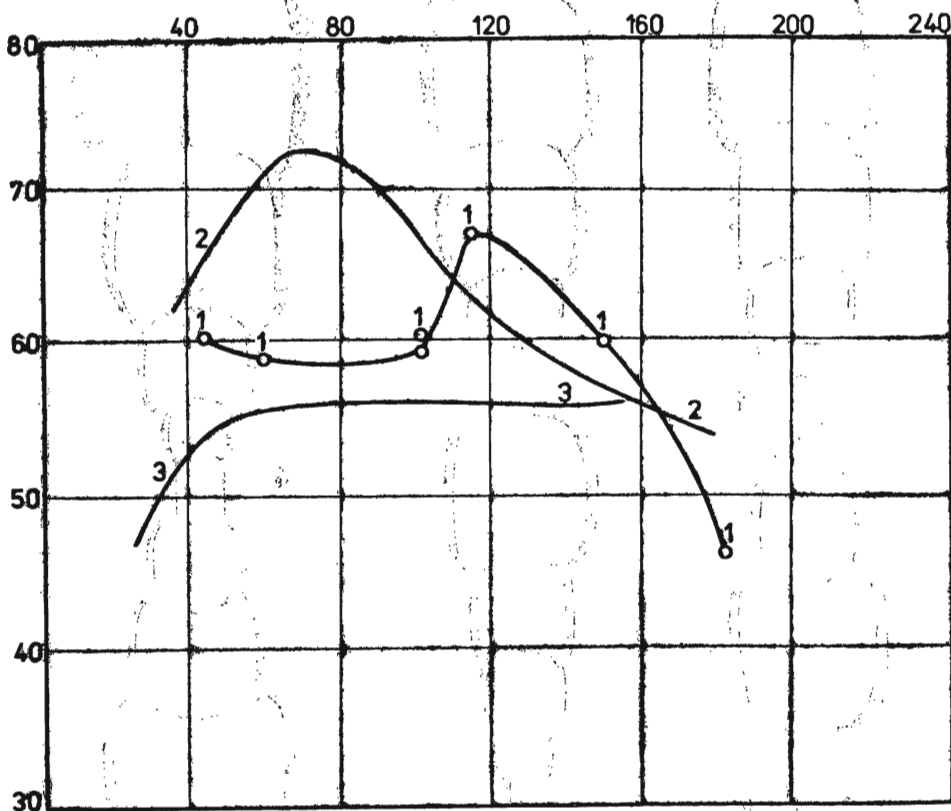


Fig. 5. Rib curves of:

Passendorferia brochwiczi sp. n.: 1 — holotype, KN5/R/3;

Passendorferia zieglerei Brochwicz-Lewiński: 2 — holotype (after Brochwicz-Lewiński, 1973);

P. teresiformis Brochwicz-Lewiński: 3 — holotype (after Brochwicz-Lewiński, 1973)

Remarks. — The species *Passendorferia brochwiczi* sp. n. differs from other species of the genus in modification of ribbing on the outer whorl. It is somewhat similar to *P. teresiformis* Brochwicz-Lewiński and especially its paratype (Brochwicz-Lewiński, 1973, p. 309; Pl. 14, Fig. 3), differing in less circular inner whorls and markedly more numerous ribs on inner and middle whorls. It differs from *P. zieglerei* Brochwicz-Lewiński in ribs less crowded on inner and middle whorls as well as in outer whorls more rectangular and compressed in outline.

The species *Passendorferia brochwiczi* sp. n. somewhat resembles the specimen figured as *Perisphinctes* (*Arisphinctes*) sp. ex gr. *tenuis* Enay by Brochwicz-Lewiński (1973, Pl. 22) in the modification of ribbing, as well as that assigned to *P. (A.) helenae* de Riaz by Malinowska (1972, p. 181, Pl. 2), differing in trend of the rib curve.

Occurrence. — In Malaga area the same as that of *Passendorferia torcalense* (Kilian), *P. zieglerei* Brochwicz-Lewiński and *P. teresiformis* Brochwicz-Lewiński.

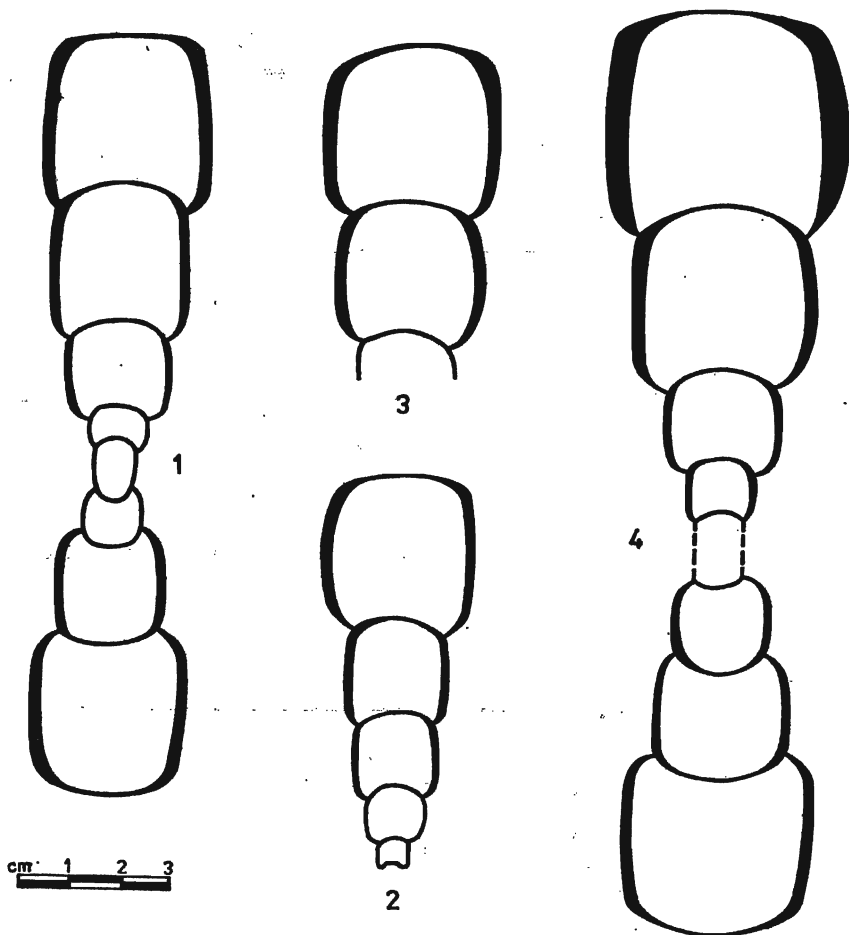


Fig. 6. Whorl sections of:
Passendorferia torcalense (Kilian): 1 — KH1/R/34,
P. zieglerei Brochwicz-Lewiński: 2 — KH1/10/1,
P. teresiformis Brochwicz-Lewiński: 3 — KH1/R/13,
P. brochwiczi sp. n.: 4 — KN5/R/3 (holotype)

CONCLUDING REMARKS

In the Oxfordian of Malaga, the representatives of the genus *Passendorferia* mainly occur in a belt stretching between El Torcal de Antequera and Canete la Real. These as well as accompanying ammonites (cf. Sequeiros, 1974a) form an assemblage very similar to that from the Middle Oxfordian of southern Poland (cf. Brochwicz-Lewiński, 1976), except for phylloceratids and lycoceratids which are

more numerous and more differentiated in Spain. The paleobiogeographic implications of that similarity of so distant ammonite assemblages are still unclear. It is only possible to state now that this similarity speaks against any barrier which would separate the Spanish fauna hitherto regarded as Mediterranean from that typical of the Submediterranean (see also Pożaryska & Brochwicz-Lewiński, 1975; and Sapunov, 1976).

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REFERENCES

- BROCHWICZ-LEWIŃSKI W. 1973. Some remarks on the origin of the subfamily Idoceratinae Spath, 1924 (Perisphinctidae, Ammonoidea). *Acta Palaeont. Pol.*, 18 (3), 299—318. Warszawa.
- 1976. Oxfordian of the Częstochowa Area. *Bull. Acad. Pol. Sci., Sér. Sci. de la Terre*, 24 (1), 37—53. Warszawa.
- & RÓŻAK Z. 1976. Oxfordian idoceratids (Ammonoidea) and their relation to *Perisphinctes* proper. *Acta Palaeont. Pol.*, 21 (4), 373—390. Warszawa.
- CRUZ SANJULIAN J. J., OLORIZ F. & SEQUEIROS L. 1973. El Jurásico Superior entre el Torcal de Antequera y Cañete la Real. *Cuad. Geol. Univ. Granada*, 4, 15—25. Granada.
- ENAY R. 1966. L'Oxfordien dans la moitié sud du Jura français. *Nouv. Arch. Mus. Hist. Nat. Lyon*, 8 (1—2), 1—624. Lyon.
- 1976. Faunes Anatóliennes (Ammonitina, Jurassique) et domaines biogéographiques Nord et Sud Téthysiens. *Bull. Soc. Géol. France*, 18 (2), 533—541. Paris.
- GEMMELLARO G. G. 1875. Sui fossili della zona con *Peltoceras transversarium* Quenst. sp. del Monte Erice or San Giuliano, nella provincia di Palermo e di Trapani. *Atti dell'Accademia di Scienze e Lettera di Palermo*, 4, 113—124. Palermo.
- GYGI R. 1977. Revision der Ammonitengattung *Gregoryceras* (Aspidoceratidae) aus dem Oxfordian (Oberer Jura) der Nordschweiz und von Süddeutschland; Taxonomie, Phylogenie, Stratigraphie. *Ecl. Geol. Helv.*, 70 (2), 435—542, Basel.
- KILIAN W. 1889. Etudes paléontologiques sur les terrains secondaires et tertiaires de l'Andalousie. *Mém. Acad. Sc. Paris*, 30, 601—762. Paris.
- MALINOWSKA L. 1972. The Middle Oxfordian Perisphinctidae of Zawodzie near Częstochowa (Poland). *Acta Palaeont. Pol.*, 17 (2), 167—212. Warszawa.
- PEYRE Y. 1974. Géologie d'Antequera et de sa région (Cordillères Bétiques, Espagne). Tesis Doctoral, *Trav. Lab. Géol. Méditerranée*, 1—528.
- POŻARYSKA K. & BROCHWICZ-LEWIŃSKI W. 1975. The nature and origin of Mesozoic and early Cenozoic marine faunal provinces; Some reflections. *Mitt. Geol.-Paläont. Inst. Univ. Hamburg*, 44, 207—216. Hamburg.
- SAPUNOV I. 1976. Ammonite stratigraphy of the Upper Jurassic in Bulgaria; I. Rock and ammonite successions. *Geologia Balcanica*, 6 (3), 17—40. Sofia.

- SEQUEIROS L. 1974a. Paleobiogeografía del Calloviense y Oxfordense en el Sector Central de la Zona Subbética. I. Bioestratigrafía del Calloviense y Oxfordense en el Sector Central de la Zona Subbética. *Tesis Doctoral Universidad Granada*, No. 65, 1—275. Granada.
- 1974b. Paleobiogeografía del Calloviense y Oxfordense en el Sector Central de la Zona Subbética. II. Ammonites del Calloviense y Oxfordense. *Tesis Doctoral Universidad Granada*, No. 65, 1—361. Granada.

L. SEQUEIROS

ALGUNOS PASSENDORFERIA (AMMONITINA) DEL OXFORDENSE DE MÁLAGA (CORDILLERAS BÉTICAS, ESPAÑA)

(Resumen)

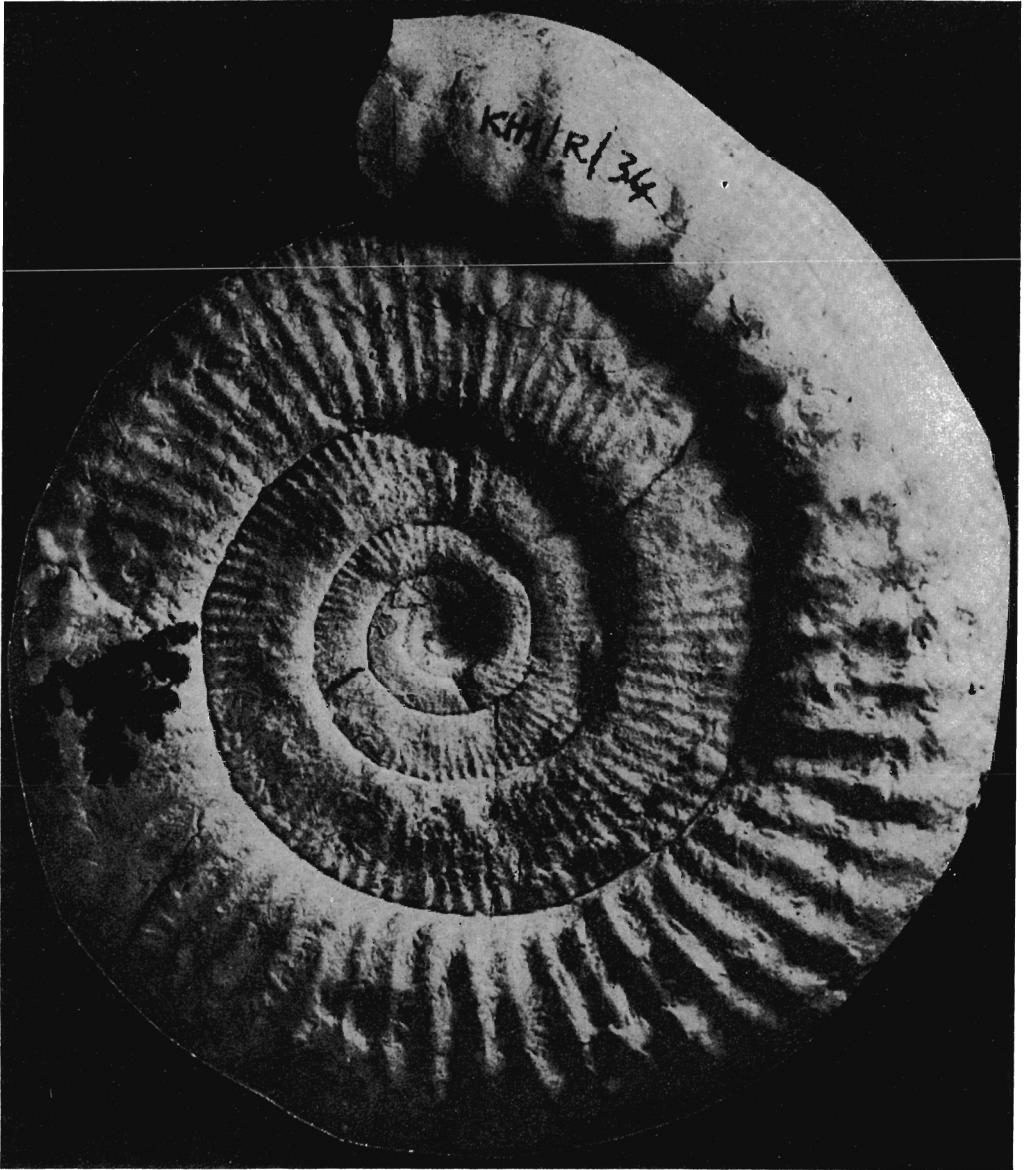
El género *Passendorferia* Brochwicz-Lewiński, 1973, está descrito en el Oxfordense de Málaga (Zona Subbética en España), entre el Torcal de Antequera y Cañete la Real (cf. Sequeiros, 1974a, b). En este trabajo presentamos una descripción de dos formas polacas presentes en España: *Passendorferia zieglerei* Brochwicz-Lewiński y *P. teresiformis* Brochwicz-Lewiński, y también dos formas típicamente subbéticas: *P. torcalense* (Kilian) y *P. brochwiczi* sp. n.

L. SEQUEIROS

OKSFORDZKIE AMONITY Z RODZAJU PASSENDORFERIA BROCHWICZ-LEWIŃSKI, 1973, ZE STREFY SUBBETYCKIEJ (PROWINCJA MALAGA) W HISZPANII

(Streszczenie)

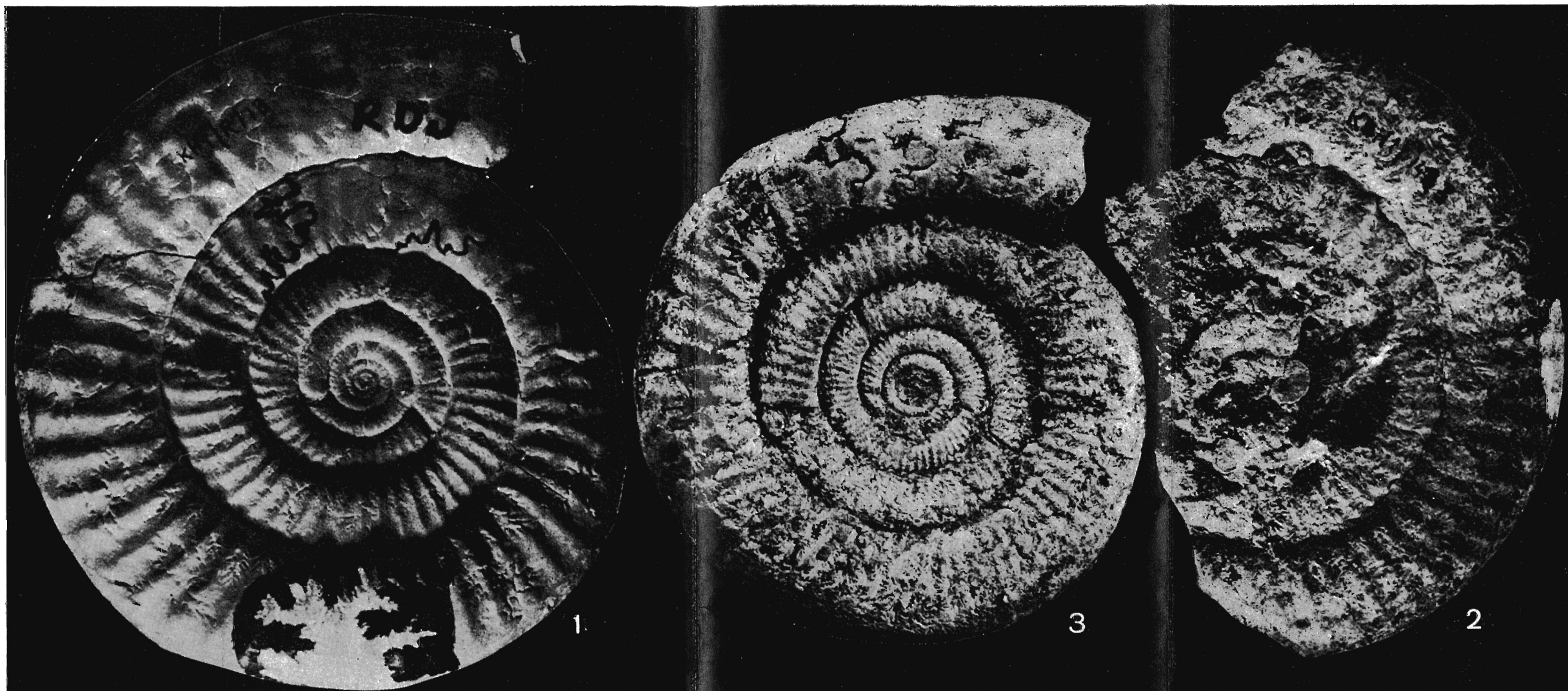
W pracy opisano amonity z rodzaju *Passendorferia* Brochwicz-Lewiński, 1973, z utworów oksfordzkich odsłaniających się między Torcal de Antequera oraz Cañete la Real w strefie subbetyckiej w prowincji Malaga w Hiszpanii. Rodzaj ten jest tutaj reprezentowany zarówno przez formy polskie (*Passendorferia zieglerei* Brochwicz-Lewiński i *P. teresiformis* Brochwicz-Lewiński) jak również i typowe formy subbetyckie, jak *P. torcalense* (Kilian), oraz przez nowy gatunek *P. brochwiczi* sp. n.



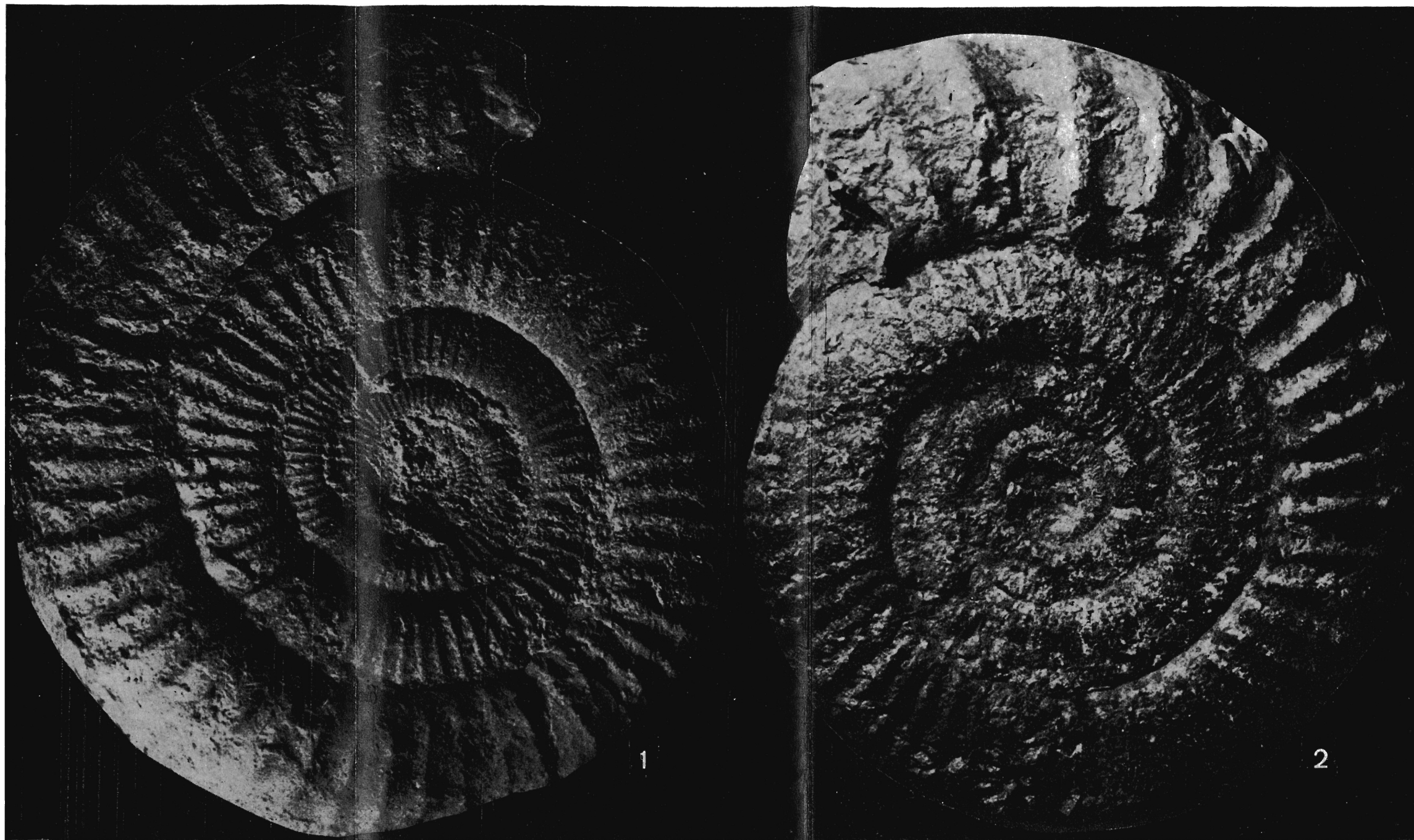
Passendorferia torcalense (Kilian); KH1/R/34; nat. size; Middle Oxfordian, Sierra de Huma (Málaga)



Passendorferia ziegleri Brochwicz-Lewiński; KT5/R/1, taken $\times 0.85$; Middle Oxfordian, Sierra del Torcal (Antequera, Málaga)



Passendorferia teresiformis Brochwicz-Lewiński: 1 — KH1/R/13, nat. size; Middle Oxfordian, Sierra de Huma (Málaga); 2 — KH1/R/32, $\times 0.66$; Middle Oxfordian, Sierra de Huma (Málaga);
Passendorferia zieglerei Brochwicz-Lewiński: 3 — KH3/R/4, $\times 0.75$; Middle Oxfordian, Valle de Abdalajís (Málaga)



Passendorferia teresiformis Brochwicz-Lewiński: 1 — KT5/R/2, nat. size; Middle Oxfordian, Sierra del Torcal (Antequera, Málaga);
Passendorferia brochwiczi sp. n.: 2 — holotype, KN5/R/3, nat. size; Middle Oxfordian, Cortijo del Navazo, Camorro Alto (Antequera, Málaga)