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SOME MIDDLE JURASSIC GASTROPODS FROM VENETO AREA (NORTHERN ITALY)

CONTENTS

K e y w o r d s : Jurassic, Bajocian, Gastropods, Northern Italy.

ABSTRACT

Some species of Bajocian gastropods, stored in the collections of the Paleontological Museum of the University of Padua were examined. *Proconulus baldensis* (PARONA), *Trochopsidea altichierii* n. sp., *Telleria benacensis* (PARONA), *Zebinostoma nicolisi* (PARONA), *Z. tardeplicata* (PARONA), *Z. eburnea* (PARONA), *Zebinostoma* sp. and one undeterminable gastropod were recognized. They come from two fossil bearing outcrops, the first exposed at Mt. Longara (Vicenza) and the second located between Acque Fredde and "i Canevini di Torri" (Verona). This fauna, together with some other faunas well known by previous studies, enables us to a better understanding of the paleoenvironmental conditions during the Jurassic of a relatively large area of the Venetian Alps. In particular on the basis of the faunal data it is possible to hypothesize for the Acque Fredde outcrop a vegetated shallow water bottom, while hard bottom forms prevail in the Sette Comuni fauna.

RIASSUNTO

Vengono esaminate alcune specie di gasteropodi baiociani delle collezioni del Museo di Paleontologia dell'Università di Padova. Sono state riconosciute: *Proconulus baldensis* (PARONA), *Trochopsidea altichierii* n.sp., *Telleria benacensis* (PARONA), *Zebinostoma nicolisi* (PARONA), *Z. tardeplicata* (PARONA), *Z. eburnea* (PARONA), *Zebinostoma* sp. ed un gasteropode indeterminabile. Tale fauna proveniente da due giacimenti del Veneto, tra Acque Fredde e i Canevini di Torri (Verona) e Monte Longara (Vicenza), insieme ad altre già note in letteratura, permette di fornire delle indicazioni paleoecologiche di dettaglio su un'area relativamente vasta del Giurassico delle Alpi venete. In particolare per l'affioramento di Acque Fredde le faune indicano un ambiente poco profondo, in acque calme su un fondo colonizzato da piante, mentre per l'area dei Sette Comuni sono prevalenti le faune di fondo consolidato.

INTRODUCTION

Jurassic gastropods of "plateau" or "swell" facies are among the less studied faunas. Only few works were concerned with their systematics and mostly by Authors of the last century. In the course of recent studies they reveal itselves very useful for a detailed paleoecology and for paleobiogeography. Unfortunately they are not so diffused and thus, serching for an ever-increasing amount of data, re-

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searches are carried out both in the field and the italian museums. It this frame some gastropods stored in the Paleontological Museum of the Istituto di Geologia, Paleontologia e Geologia applicata of the Padua University were studied. The studied fossils are unpublished or, at least, unfigured specimens that come from different localities of the Veneto area in Northern Italy. More exactly, some specimens, labelled as "Monte Longara, sopra Gallio, Strati a Posidonia alpina", come from M. Longara, Sette Comuni Plateau (Vicenza), and others, labelled as "fra Acque Fredde e i Canevini di Torri" from an outcrop near Torri del Benaco (Verona).

Gastropods coming from fossil bearing beds outcropping in the same area were studied by DE GREGORIO (1886) and PARONA (1880, 1894, 1896). These last outcrops and the ones from wich our faunas come may be even the same. The rich fauna coming from the Acque Fredde area was described by PARONA (1894) and recently revised by CONTI and FISCHER (1983). It comes from neptunian dike infillings of the Subfurcatum zone of Bajocian age (STURANI, 1971; CONTI and FISCHER, 1983). STURANI (1971) in its monograph on the ammonites and stratigraphy of the "*Posidonia alpina*" beds provided also some paleoenvironmental considerations; to do it he utilized, but only marginally, the gastropods. Thus the material at our disposal enriches the knowledge on Jurassic gastropods of the Veneto area both from the systematic and paleoecological point of view.

According to the Museum register the M. Longara material, consisting of rock blocks, was included in a collection purchased in 1886. This material was studied by C.F. PARONA who prepared and classified the fossils and gave them back to the Museum. One specimen was published by PARONA himself (1896) and perhaps some observations about other specimens were given in a footnote by the same Author (PARONA, 1896, p. 26). Also if the material was registered at the Museum between a registration lot of 1894 and another of 1895 it seems possible that PARONA gave it back some years before. In fact one specimen, wich is labelled as *Trochus (Zizyphinus?, Carinidea?)*, is to be included into a species established in the Acque Fredde material by the same Author (PARONA, 1894). It seems probable thus that the material had been studied by PARONA some years before 1894 and had been given back to the Museum before the registration year. The remaining part of the material comes from the other locality between Acque Fredde and Canevini di Torri. Unfortunately there are no informations about the collector of this latter material. Because the labels were written on newspaper pieces or on the backside of leaflets, an approximative idea of the collection age can be obtained in the light of the arguments printed on those. The main topic being the First World War propaganda against the Central Empires, we can hypothesize that the material had been collected approximately between 1915 and 1920.

The material consists of 19 specimens of the following species: *Proconulus baldensis* (PARONA), *Trochopsidea altichierii* n. sp., *Telleria benacensis* (PARONA), *Zebinostoma nicolisi* (PARONA), *Z. tardeplicata* (PARONA), *Z. eburnea* (PARONA), *Zebinostoma* sp., all preserved with the recrystallized shell, and one inner mould of an undeterminable gastropod.

SYSTEMATICS

Phylum *MOLLUSCA*
Class *GASTROPODA*
Family *TROCHIDAE* RAFINESQUE, 1815
Genus *Proconulus* COSSMANN, 1918
Proconulus baldensis (PARONA, 1894)
(Pl. I, figs. 1, 2, 3)

1894 *Trochus (Zizyphinus) baldensis* n.sp. - PARONA, p. 389, t. I, f. 35
1981 *Proconulus rimosus* n. sp. - SZABÒ, p. 57, pl. 1, f. 9-13
1983 *Proconulus baldensis* (PARONA) - CONTI and FISCHER, p. 493, f. 2, t. 1, f. 6-8
1984 *Proconulus baldensis* (PARONA) - CONTI and FISCHER, p. 135, pl. II, f. 1 a-b, 2
1987 *Proconulus baldensis* (PARONA) - CONTI and SZABÒ, p. 47, f. 2

Material: four specimens (15074, 26596, 26602, 26603).

Provenance: 15074 - Monte Longara upon Gallio (Sette Comuni); 26596, 26602, 26603 - Between Acque Fredde and Canevini di Torri.

Dimensions: (in mm)

	H	Hlw	Ha	maxD	A
15074	10	6	—	7	46°
26596	10	6	4	7	50°
26602	10	6	4	8	45°

Remarks: The specimen 15074 was labelled by PARONA as *Trochus (Zizyphinus?, Carinidea?)*, is to be attributed without doubt to PARONA's species (1894). Perhaps PARONA mentioned this specimen in a footnote (1896, p. 26, footnote 3) "Riscontrai altri gasteropodi. . . che non posso descrivere né figurare. . . *Carinidea*(?) l'altro. . .". As already underlined in CONTI and SZABÒ (1987) this species is morphologically variable in the whorl profile and for the suture running in a more or less deep furrow. In fact while the specimen coming from M.

Longara is strictly similar to the holotype, two other specimens (26596 and 26602) are more similar to the Umbrian specimens because of the less canaliculate sutures and in the more flattened profile of the whorl. The species is known form Bajocian sediments in Sicily and Umbria (Italy) and Bakony Mt. (Hungary).

Family *ATAPHRIDAE* COSSMANN, 1818
Genus *Trochopsidea* WENZ, 1938

Trochopsidea altichierii n. sp.
(Pl. I, figs. 4, 5, 6, 7)

Material: 8 specimens: 26606 holotype, 26607 and 26608 paratypes and five specimens labelled 15077.

Type locality: Monte Longara upon Gallio, Sette Comuni plateau (Vicenza).

Type level: Bajocian, ?Subfurcatum zone.

Derivatio nominis: Named after LUCA ALTICHIERI, Curator of Paleontological Museum of Padua University.

Dimensions: (in mm)

	H	Hlw	MaxD	A
26606	4.5	4	5	103°
26607	5	4	3.5	96°
26608	3.5	4	3.5	94°

Diagnosis: Small with moderately high spire. Protoconch short. Whorls regularly convex, smooth. Growth lines thin, weakly opistocyrt and prosocline. Sutures sunken. Peristoma simple, columellar lip with a faint thickening.

Remarks: Perhaps PARONA (1886) mentioned this small form in footnote 3 of p. 26 ". . . parecchi esemplari di un piccolo *Athaphrus*(?). . .". The general features of the spire, with whorls inflatened and divided by evident and sunken sutures, and the characteristics of the collabral lines (the aperture is not visible in any specimen) permit to ascribe this species to the genus *Trochopsidea*. This small species differs from *T. kondai* SZABÒ, 1981 in having the more uniformly rounded whorl which covers less the precedent whorl. Besides the regular shape of whorl allows to distinguish our species from the liassic *T. latilabra* (STOLICZKA, 1861). The low spire distinguishes this species from *T. paronai* CONTI and FISCHER, 1983. *T. paludinoides* (HUDLESTON, 1894) has affinity with our species because of the shape of the whorls. However, it presents a more rised spiral. The juvenile specimens of the genus *Zircia* SZABÒ, 1981 and of the genus *Trochopsidea* and thus *T. altichierii* n. sp. are quite similar in appearance. However, the new species is neither a juvenile stage of *Zircia (Cycloturbo) francisci* (PARONA) because this has the depressed whorls in the adapical part, nor a juvenile *Zircia zircensis* SZABÒ, with a decidedly more elevated spire with a subsutural line.

Family *COELOSTYLINIDAE* COSSMANN, 1909
Genus *Telleria* KITTL, 1894

Telleria benacensis (PARONA, 1894)
(Pl. I, figs. 8, 9, 10)

1894 *Narica benacensis* n. sp. - PARONA, p. 384, t. I, f. 28
1983 *Telleria benacensis* (PARONA) - CONTI and FISCHER, p. 505, f. 10, t. II, f. 15-21
1987 *Telleria (Telleria) benacensis* (PARONA) - CONTI and SZABÒ, p. 50

Material: one specimen (26597).
Provenance: Between Acque Fredde and Canevini di Torri.
Dimensions: (in mm) H 10, Hlw 8, Ha 6, maxD 8, A 79°.

Remarks: The specimen is not well preserved but is perfectly similar to the holotype. The species, although relatively rare in each outcrop, is known in different regions Veneto (Italy) and Bakony Mt. (Hungary).

Family *RISSOINIDAE* COSSMANN, 1918
Genus *Zebinostoma* CONTI and FISCHER 1984

Zebinostoma nicolisi (PARONA, 1894)
(Pl. I, figs. 19, 20)

1894 *Cerithium (Colina) nicolisi* n. sp. - PARONA, p. 380, t. I, f. 17
1894 *Rissoa labiosa* n. sp. - PARONA, p. 383, t. I, f. 26
1986 *Zebinostoma nicolisi* (PARONA) - CONTI and MONARI, p. 192, cum syn.

Material: 3 specimens (26599, 26605, 26609).
Provenance: Between Acque Fredde and Canevini di Torri.

Dimensions: (in mm)

	H	MaxD	A
26599	(part.) 11	3.5	12°
26605	(part.) 13	4	10°

Remarks: The specimens, although incomplete, are surely to be ascribed to PARONA's species. The ornamentation is very variable, the spiral treads change in number and size in different specimens. On the other hand a strong variability is characteristic of this species. The species is relatively frequent in the Umbrian outcrops.

Zebinostoma tardeplicata (PARONA, 1894)
(Pl. I, figs. 12, 13, 14)

1894 *Nerinea (Ptygmatis) tardeplicata* n. sp. - PARONA, p. 382, t. I, f. 24
1983 *Zebinostoma tardeplicata* (PARONA) - CONTI and FISCHER, p. 516, f. 18, t. III, f. 6,7

Material: 2 specimens (26600, 26604).

Provenance: Between Acque Fredde and Canevini di Torri.

Dimensions: (in mm)

	H	MaxD	A
26600	(part.) 8	3	10°
26604	11	3	8°

Remarks: The specimens are incomplete and do not show the radial costae which are the character individualizing in this species the more advanced ontogenetic stages. Due to the spiral ornamentation this species could be confused with *Z. nicolisi* (PARONA), but the slightly inclined sutural lines and the shape of the worls and of the base allow to distinguish them even though the specimens are incomplete.

Zebinostoma eburnea (PARONA, 1894)
(Pl. I, figs. 15-16)

1894 *Rissoina eburnea* n. sp. - PARONA, p. 381, t. I, f. 25

1983 *Zebinostoma eburnea* (PARONA) - CONTI and FISCHER, p. 513, f. 16, t. III, f. 12-14

Material: One specimen (26598).

Provenance: Between Acque Fredde and Canevini di Torri.

Dimensions: (in mm) H(part.) 12, maxD 2.5, A 5°.

Remarks: The material is badly preserved and it is impossible to recognize the ornamentation, but the general shape of the shell, the whorl shape and the characteristics of the columella allow a certain determination of the specimen.

Zebinostoma sp.
(Pl. I, figs. 17-18)

Material: One specimen (26601).

Provenance: Between Acque Fredde and Canevini di Torri.

Dimensions: (in mm) H 9, max D 3, A 6°.

Description: Turricolate shell with whorls strongly swollen in the abapical part and slightly flattened in the adapical one. Linear and well impressed sutures. The ornamentation consists of costellae on all the whorls and of weak spiral threads. Two spiral threads, clearly visible, lay near the adapical suture and another near the abapical one. Three spiral threads run along the base. Columella gently arched.

Remarks: It is an incomplete specimen lacking in the first whorls and in the aperture. It shows strong affinity with *Zebinostoma* aff. *nicolisi* (PARONA) of CONTI and FISCHER (1983, p. 515). However, we prefer to consider this specimen still distinct from both *Z. nicolisi* (PARONA) and *Z.* aff. *nicolisi* (PARONA) *sensu* CONTI and FISCHER (1983) and leave with an open nomenclature because of the lack of other specimens that would be necessary for clarifying its systematic position.

Gastropod indet.
(Pl. I, fig. 21)

1896 *Trochus rasgus* DE GREGORIO - PARONA, p. 25

Material: one specimen (15070).

Provenance: Monte Longara upon Gallio (Sette Comuni).

Remarks: On the original label there is a question mark before the name of the genus: probably PARONA thought that the material was so badly preserved that it did not permit a sure attribution. Moreover, in the 1886 paper the same Author underlinesthe bad state of preservation of the material. We donot believe that, it being an inner model, with only small fragments of recrystallized shell, any attribution is possible, even if the specimen shows likeness with the type of DE GREGORIO (1886).

STRATIGRAPHY

CONTI and SZABÒ in a recent paper (in print) analyzed the stratigraphical meaning of the Bajocian gastropods of the intra tethyan region. We believe that the venetian gastropods pertain to the same paleobiogeographical region, as defined by CONTI and SZABÒ (1987). This paleobiogeographical unit could at least enclose Southern Alps and Central Apennines (Italy), the Bakony Mt. (Hungary) and probably the west Carpathians. In the paper by CONTI and SZABÒ (in print) the gastropods were groupped, on the basis of their frequency and geographical distribution, in four categories with different stratigraphical usableness. Thus the biostratigraphical meaning of the gastropods here described will be examinated in the same way.

According to the original labels the material here studied comes partly from the "*Posidonia alpina* beds" exposed at Mt. Longara upon Gallio (Vicenza) and partly from undetermined levels between Acque Fredde and Canevini di Torri (Verona). These last probably corresponding to the same neptunian dike infillings described by PARONA (1894) and attributed by STURANI (1971) and by CONTI and FISCHER (1983) to the Bajocian Subfurcatum zone. The age determination of the material coming from M. Longara seems to be more complex. STURANI (1971) studied the outcrops of the Sette Comuni area and attributed to them an age corresponding to the Humpriesianum, Subfurcatum and Garantiana

zones. In particular he attributed the ammonites stored in the Padua Museum which come from Mt. Longara to the Subfurcatum zone. Probably they were collected in the same fossil bearing levels from which the gastropod come.

On the basis of the other studies carried out on the biostratigraphical value of gastropods it is possible to attribute to the gastropod faunas an early Bajocian age. *P. baldensis, Telleria benacensis* and *Z. nicolisi*, of the seven species here classified are included among the forms considered as meaningful for the lower Bajocian stratigraphy by CONTI and SZABÒ (in print).

PALEOECOLOGICAL CONSIDERATIONS ON THE ACQUE FREDDE GASTROPOD ASSEMBLAGE

The Acque Fredde faunal assemblage, including both the faunas here described and the fauna described by PARONA (1894) and by CONTI and FISCHER (1983), enables us to make some environmental remarks. In particular, if we consider the fauna on the whole, it results constituted by 29 gastropod species just revised and five species not yet reexamined. Applying to it the paleoecological models suggested by CONTI and SZABÒ (1987) the resulting life environment reconstruction is quite evident. The data assumed for the mode of life of the 29 recognized gastropod species are the following:

Scurriopsis cucullinculus (PARONA) hard bottom, depth 0 to near 50 m, herbivorous;

Proconulus baldensis (PARONA) hard bottom, depth 0 to about 150 m herbivorous or plant detritus feeder;

Ozodichilus plicatogranulosus (PARONA) hard bottom (?), depth 0 to about 50 m, herbivorous or plant detritus feeder;

Cocleochilus rinae (PARONA) bottom with vegetation living on plant, depth around 50 m, herbivorous or plant detritus feeder;

Ataphrus (Endianaulax) acutum CONTI and FISCHER, *Trochopsidea paronai* CONTI and FISCHER, *Zircia zircensis* SZABÒ, *Zircia (Cycloturbo) francisci* (PARONA), *Eucycloscala acanthicum* (UHLIG): hard bottom, depht near 50 m, herbivorous or plant detritus feeders;

Neritoma (Neridomus) paronai CONTI and FISCHER, *Neritoma (Neridomus) modestissima* CONTI and FISCHER: depth 0 to about 50 m, grazers on plant;

Paleocollonia angeli (PARONA), *Mariottia lateumbilicata* (UHLIG): hard bottom (?), depth 0 to about 50 m, herbivorous or detritivorous;

Telleria benacensis (PARONA), *Telleria petri* (PARONA), *Paronaella subcylindrica* (PARONA), *Paronaella pupoides* (PARONA): hard bottom, depth around 50 m, carnivorous (?);

Trypanostylus sturanii CONTI and FISCHER, ?*Trypanostylus incertus* CONTI and FISCHER: bottom with vegetation living on plants, depth around 50 m;

Rissocerithium nicosiai CONTI and FISCHER bottom with vegetation living on plants, depth around 50 m, herbivorous or biting on plants;

Zebinostoma eburnea (PARONA), *Zebinostoma nicolisi* (PARONA), *Zebinostoma* cfr. *nicolisi* (PARONA), *Zebinostoma* aff. *nicolisi* (PARONA), *Zebinostoma tardeplicata* (PARONA), *Zebinostoma turrita* (PARONA), *Zebinostoma* sp.: bottom with vegetation living under plants, depth around 50 m, biting on plants;

Lamelliphorus suessi (UHLIG), *Lamelliphorus rhombifer* (UHLIG): soft bottom, depth 0 to uppermost bathyal, plant detritus feeders.

From the same outcrop were point out (PARONA, 1894) the following species: *Trochus (Textus) circumspinatus* UHLIG, *Pleurotomaria uhligi* PARONA, *Spinigera* sp. indet., *Cerithium* sp. indet., *Neritopsis spinosa* HERBERT and DESLONCHAMPS. These forms were not revised, due to the uncertain systematical position it is impossible to give paleoecological reinsegnements.

On the whole, *ACMEIDAE, TROCHIDAE, ATAPHRIDAE, CROSSOSTOMATIDAE* and *COELOSTYLINIDAE* (*Telleria*) were hard bottom dwellers, mostly herbivorous or plant detritus feeders with the exception of *Telleria* which was probably carnivorous. *Trypanostylus* and *Rissocerithium* settled on plants for the whole life span while *Zebinostoma* species lived biting near their base.

CONCLUSIONS

The described material seems to be very important because permit us to better specify what suggested by STURANI (1971) for the paleoenvironment of the "*Posidonia alpina*" beds on the whole. In fact the M. Longara and the Acque Fredde faunas reveal slightly different life environments.

As regards the Acque Fredde outcrop, the bathymetrical range of the fauna was between 0 and 50 m, more probably near the lower limit of this interval. This because at that depth quiet environments colonized by plants are and were the most common. The kind of bottom was probably a consolidated ground, colinized, at least partially, by marine plants. With the term "consolidated" we mean the concept of "firm-ground" more than the concept of "hard-ground". Mostly because the percentages of Trochids, Turbinids and Crossostomatids, characteristic forms of true hard-grounds, are

low in percentage. On the contrary the percentage of forms living on plants or near their base is very high, especially if considered on the basis of the number of individuals. In fact herbivorous, grazers, biting on plant and plant detritus feeders exceed the 70% of the fauna. By the ecological point of view this outcrop might be successfully compared to the Umbrian ones (CONTI and SZABÒ, 1987).

As regards the Sette Comuni area, although the faunistic list is not completely up-to-dated (in fact a revision of the gastropods described by PARONA, 1880; 1896 and DE GREGORIO, 1886 is necessary), in the studied material, there are overall hard-bottom forms while the Rissonids and the other forms of vegetated environment seem to be completely absent. Plants probably were only scattered and however the environment was different by the vegetated bottom. By the ecological point of view the Sette Comuni fauna might be considered near to that of the hungarian Bakony Mt. (CONTI and SZABÒ, 1987). The abundance of patelliform gastropods in this last italian fauna seems to be indicative of a life in a shallower water in respect to the hungarian fauna.

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EXPLANATION OF PLATE I

FIGS. 1-3 - *Proconulus baldensis* (PARONA) (x 5); 1) specimen 15074 M.te Longara upon Gallio; 2) specimen 26596, 3) specimen 26602: between Acque Fredde and Canevini di Torri.

FIGS. 4-7 - *Trochopsidea altichierii* n.sp. (x 6); 4) 26606 holotype; 5) 26607 and 6) 26608 paratypes. M.te Longara upon Gallio.

FIGS. 8-10 - *Telleria benacensis* (PARONA) (x 5.5). Between Acque Fredde and Canevini di Torri.

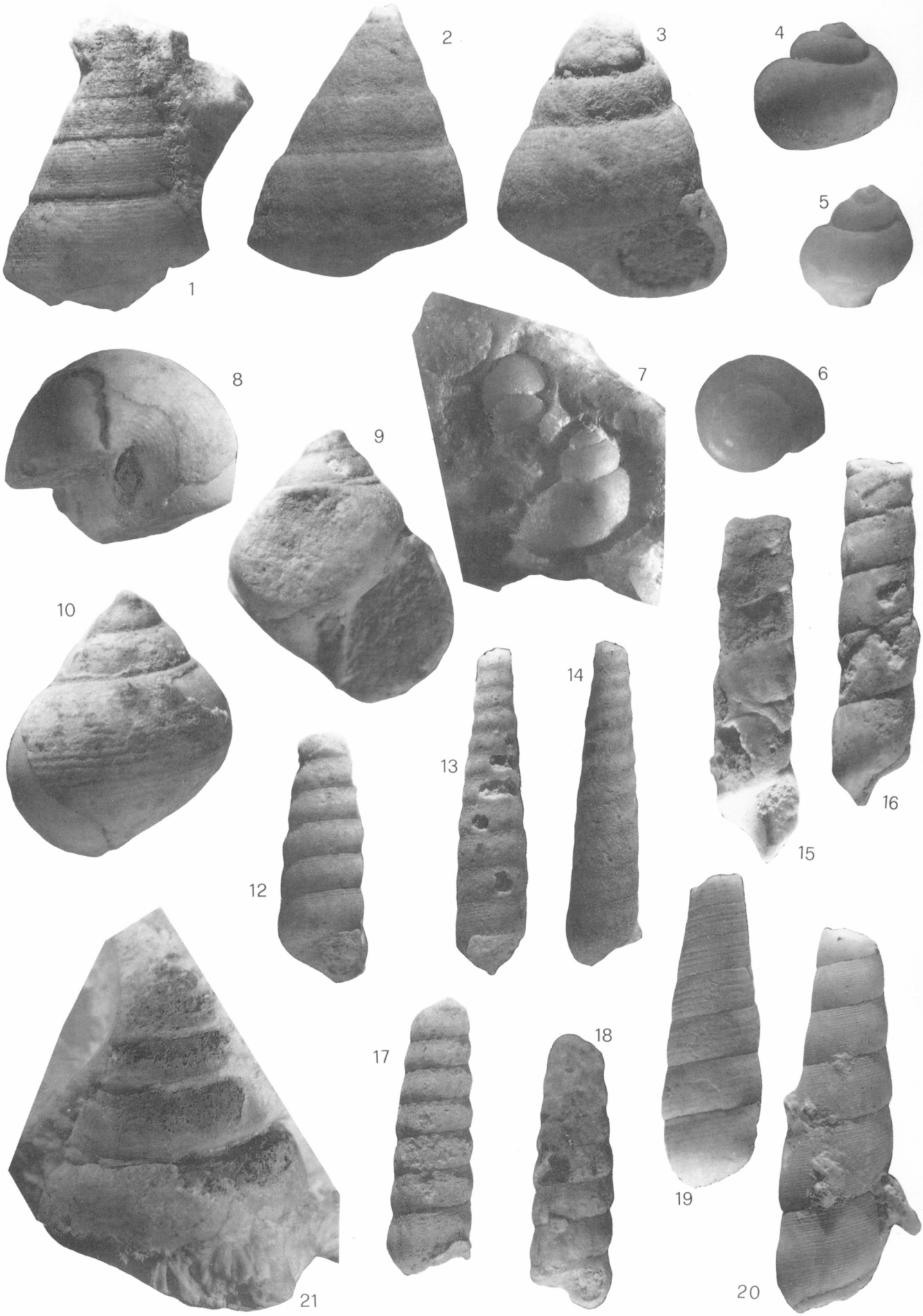
FIGS. 12-14 - *Zebinostoma tardeplicata* (PARONA). Between Acque Fredde and Canevini di Torri. 12) 26600 (x 6), 13-14) 26604 (x 5.7).

FIGS. 15-16 - *Zebinostoma eburnea* (PARONA) (x 5.5). Between Acque Fredde and Canevini di Torri.

FIGS. 17-18 - *Zebinostoma* sp. (x 5.5). Between Acque Fredde and Canevini di Torri.

FIGS. 19-20 - *Zebinostoma nicolisi* (PARONA) (x 5.5). Between Acque Fredde and Canevini di Torri. 19) 26599, 20) 26605.

FIG. 21 - Gastropod indet. (x 5.5) M.te Longara upon Gallio.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