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Involutina farinacciae Bronnimann & Koehn-Zaninetti 1969, a marker for the Middle Liassic in basinal and some platform facies of Mediterranean and near east areas; the discussion concerning the paleogeography of Montenegro-Albania border region (the Scutari–Peć Lineament)

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Abstract. Foraminiferal species *Involutina farinacciae* Bronnimann & Koehn-Zaninetti, is a marker of Middle Liassic basinal and transitional platform bassin facies widely distributed in Mediterranean area (Umbria–Marche, Pindos, Budva, Sicilia and the Inner Dinarides basin), also in Iraqi Kurdistan ("Avroman" Basin). In the Dinaric Carbonate Platform (DCP) it indicates intramarginal and intraplatform depressions.

Paleogeography of the Montenegro–Albania border area formed by the inherited prealpine paleogeographic scenario that resulted in a different arrangement of the paleogeographic units westward and eastward of the paleostructure (Scutari–Peć Lineament) which controlled the geological history of the region. This transverse paleostructure was a) coincident with the paleogeographic front of the DCP, and b) the westward limit of the overtrusted Mirdita Zone. The difference in the paleogeographic features in the prolongation from the DCP througout Albania, controlled by paleostructure, are the source of seizmicity, rotation and deviation (SE to NW, into NE) of the Complex Mirdita Zone.

Key words: *Involutina farinacciae*, marker, Middle Liassic, distribution, Budva Basin, Scutari–Peć lineament.

Апстракт. Приказани су наласци врсте *Involutina farinacciae* Bronnimann-Koehn Zaninetti у басенским сукцесијама Ирачког Курдистана (област Авромана), у јединицама унутрашњих Динарида, Умбрија–Марке, Будва–Краста, Пиндос и Сицилија. На простору Динарске карбонатне платформе ова врста се јавља у интрамаргиалним или трансверсалним депресијама, ареалма отворене маргине и прелазног појаса платформа–басен. Поред неколико општих података о Будва басену, зложени су податци о палеогеографији граничне области Црна Гора–Албанија (Скадар–Пећ линија).

Кључне речи: *Involutina farinacciae*, маркер, средњи лијас, распрострањење, Будва басен, Скадар–Пећ линија.

Introduction

Bronnimann & Zaninetti (1969) described *Involutina farinacciae*, a new foraminifera species, based on specimens from the Middle Liassic of Lacium, southern Italy, ascribed by Farinacci (1967), to *Semiinvoluta clari* Kristan.

The species *Aulotortus regularis* Zuccari, 1969, described from the Middle Liassic of Umbria, is a younger synonym of *I. farinacciae*, because the note with the description of the species was being in print when *I. farinacciae* was published (Zuccari 1969, postscriptum on p. 426).

Involutina scandonei (Radoičić 1969) is also a younger synonym of *I. farinacciae* being published at the end of year 1969. *I. scandonei* was described from the Lower Dogger of the Budva Basin (Lastva section), also known from similar basinal sediments of Pindos (Koziakas), Sicily (Valone Crisanti) and from the Inner Dinarides of SW Serbia. According to the manuscript geological map SW Serbia, sheet Užice, limestone with *I. scandonei* forms the lower part of Diabase Chert Formation ("Lower Dogger"). Therefore, without additional information the same age is given to the sediments bearing this species, which has been revised. *I. farinacciae* occurs, as in the

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type area, through the middle part of the Liassic stratigraphic column (RADOIČIĆ 1987). No finer stratigraphic distribution can be given at present.

In addition to information about the Liassic sequences in which *I. farinacciae* occurs, few references are made to the Budva Basin and to the paleogeography of the Montenegro–Albania border area (the Scutari–Peć lineament).

Geographic distribution and biostratigraphy

I. farinacciae is the species of very large geographic distribution. In addition to the mentioned areas, it is reported from Iraqi Kurdistan, from the Inner Dinarides, Dinaric Carbonate Platform, and from the Budva Basin.

Iraqi Kurdistan

In the Avroman Range area, NE Iraq, the Jurassic–Cretaceous carbonate clastics- cherty series are very similar to those of the Budva and Pindos Basins. The Liassic intervals consist of siliceous calcilutites, calcutites with radiolaria and resedimented carbonates and microbreccias. Resedimented limestones bearing *I. farinacciae* have been found in five locations: NW and SW of the village Seh Riyawra, NW of Tut Agaj, the right bank of the Wadi Chagan (toward Gala Zadri) and near to the village Zangi Sura (RADOIČIĆ 1987, foot-note in the Serbian text).

Inner Dinarides

Mountain Zlatibor

Liassic ooidal-peloidal limestones with *I. farinacciae* from Drežnik (Pl. 1, Fig. 1), the NW area of the Zlatibor ophiolite massif, previously ascribed to the “Diabase Chert Formation”(DCF), are most likely only the middle Liassic sequence in the succession underlying DCF (MOJSILOVIĆ *et al.* 1971). Identical limestone with *I. farinacciae, Agerina martana* and some other foraminifera, are found near the Bela Reka on SE Zlatibor Range (Pl. 1, Figs. 10, 11).

The stratigraphic gap between the DCF and the underlying carbonate sediments, in Zlatibor region, occurs at different ages: from the Rhaetian–Liassic, upper Liassic or ?lower Dogger.

Sjenica–Prijepolje

The “Dogger and Malm limestones with chert” of the Diabas Chert Formation are outcropped near Sjenica and WSW of Sjenica toward Prijepolje (Geological Map sheets Sjenica and Prijepolje; MOJSILOVIĆ *et al.* 1973; ĆIRIĆ *et al*. 1977). In a paper on DCF in this area, JOVANOVIĆ *et al.* (1979) describe the limestone-chert unit near Vrelo as the Diabase Chert Formation “III litotype”. Ooidal limestone is mentioned from the older part of the stratigraphic succession, in which certain layers bear “atypical microfossil association”. Tithonian marly micrite containing *Calpionella alpina* and *Calpionella elliptica* is the youngest of the described geological column. Evidence of an older, Liassic part of the limestone-chert unit that was taken to be a member of the DCF, are the association *I. farinacciae*, *Bosniella* cf. *oenensis, A. martana* from the sediments near Vrelo (Pl. 1, Fig. 7). Consequently, the ?continous stratigraphic succession at Vrelo includes sediments both older and younger than the Diabase Chert Formation, respectively underlying and overlying formations (age correlative to Krš Gradac, RADOIČIĆ *et al.* 2009). The same Liassic resedimented ooidal-peloidal limestones are sampled in the belt Sjenica–Gomila and at Duboki potok in Aljinovići–Prijepolje area (Pl. 1, Figs. 2–6).

Dinaric Carbonate Platform

Slovenia, northern sector of the Dinaric Carbonate platform.

I. farinacciae occurs in:

– Potpeč shallow intamarginal depression; the succession consists of largely of resedimented biota (*Lithiotids,Orbitopsella, Paleodasycladus*), from a shallow platform, less of ooidal shoals distributed on an open margin (RADOIČIĆ 1987). *I. farinacciae* was found in a few beds bearing resedimented material from ooidal shoals or even mixed material from both areas.

– a transitional platform-basin succession observed at a gallery near the Avče Railway Station, where *I. farinacciae* is associated with *A. martana* and *Mesoendothyra croatica* (species described from Dogger: GUŠIĆ 1969), genus? “A1”, tekstulariform and other foraminifera (Pl. 2, Figs. 1–11); and

– a section near the village of Kovk, northern margin of the Dinaric Carbinate Platform. This Pliensbachian into Toarsian succession consists of (a) lithiotid limestone, (b) peloidal limestone, and (c) brownish-redish limestones with hard ground. Peloidal limestone with *Orbitopsella primaeva* bears also *I. farinacciae, Ammobabulites* sp., ? *Haplophragmoides*, ?*Spiraloconulus* (ČRNE & GORIČAN 2009).

Montenegro, southern sector of the Dinaric Carbonate Platform

I. farinacciae occurs in the Liassic Viluse succession (Grahovo–Viluse area) as deposits in a very shallow depression (laterally, westward and eastward, gradually passing into lithiotid facies), situated along the Boka Kotorska–Gacko transversal lineament.

The section, discontinually exposesd consists in part of thin bedded limestones mainly with few fossils: sponge spicules, crinoid fragments and lagenids; ooidal peloidal limestones with sparse benthic foraminifera, few beds with brachiopod coquina. Dolomitized limestone is also present. The oldest sampled bed, twenty meters below the first occurence of *I. farinacciae*, is Lower Liassic limestone with *Involutina turgida* KRISTAN (Pl. 3, Fig. 9). *I. farinacciae,* associated with *A. martana* and some other foraminifera, was found in several samples from the column interwal of about 35 meters (Pl. 3, Figs. 1–7).

Budva Basin (Budva–Krasta–Pindos)

Different stratigraphic successions formed in the intracontinental Budva Basin (Upper Permian to Upper Miocene) are exposed largely along the Montenegrin coast. Data concerning the sedimentary evolution of the Basin and the spatial distribution of the stratigraphic successions are based on the facies analysis. Internal proximal (more or less proximal, distally proximal), axial subaxial, and external proximal-subaxial successions are recognized on the territory covered by the geological map sheets Kotor and Budva. Some successions reveal gradual facies change to the NW (present-day direction) through the length of the Basin. The transitional DCP–BB proximal series are especially different (and inadequately known), which suggests a complex and highly variable (through successive cycles) scenario of the periplatform paleogeography.

Intrabasinal and basin-platform sinsedimentary tectonic activity of varied magnitude and effects (fractures, breccias, stratigraphic gaps, great proportion of resedimented carbonates, different slump structures and trust faults) are clearly manifested in the history of the Basin. Some time-stratigraphic intervals were more intensive in tectonic activity (Middle Triassic, Rhaetian–Liassic, Kimmeridgian–Berriasian, Middle Cretaceous, Campanian and others). Miocene tectonic events greatly affected the successions: some were thrust folded, overturned, others were more fractured, or greatly or almost completely reduced. West of the Kotor Gulf, the Budva Basin successions are traceable to the transverse Zupci Fault where this notable unit disappears abruptly under the Dinaric Carbonate Platform. Assumed based on the facial changes in some belts down the basin length to NW, the basin must have narrowed gradually (changed dimensions and depth) to become (NW of Split?), a lower-rank unit.

Biostratigraphical data for the unit, acquired during geological mapping for the sheets Kotor and Budva and by subequent studies, are published in part (ANTONIJEVIĆ *et al.* 1973; RADOIČIĆ & D'ARGENIO 1999).

The biostrarigraphy of the pelagic Upper Triassic (?uppermost Ladinan–Upper Triassic) is interpreted based on *Daonella* and *Halobia* (DE CAPOA BONARDI 1985; CAFFIERO & DE CAPOA BONARDI 1980a) and conodonts (CAFFIERIO & DE CAPOA BONARDI 1980b).

The most informative, detailed and conpehensive study by ŠPELA GORIČAN (1994) of the Jurassic and Cretaceous biostratigraphy and sedimentary evolution on the Budva Basin is based prmarily on radiolarian stratigraphy and subordinately on other fossil groups. The study considered the extent of the Budva Basin successions on the map sheets Kotor, Budva and Bar.

Previously taken for Upper Eocene or Upper Eocene–Lower Oligocene, the main deformation of the Outer Dinarides is now dated not older than early Tortonian, bases on calcareous nanoplankton from the Tertiary sediments of the Budva Basin and of both, the Dinaric and Adriatic Carbonate Platforms (CN7b biozone: DE CAPOA & RADOIČIĆ 1995).

Liassic sequences (calcilutites with chert, cherts, thin marly layers, subordinate breccias and more or less fine resedimented carbonates) 20–35 meter thick, in which *I. farinacciae* is present, known from the sections Vrmac–Verige, Donja Lastva, Devesilje, Košljun and from the external distally-proximal, subaxial Meljine, Banići and Buljarica–Čanj.

Vrmac–Verige succession

Liassic sediments of the Vrmac–Verige belt is cropps out westward (Verige section, N of Kamnari) and eastward from the Verige Strait (in a small quarry of Lepetane, now urbanized). Lowermost in the upper Triassic–?lowermost Liassic exposure is breccia (1.5 m) containing large Triassic intraclasts, overlain by about 40 meters of siliceous calcilutites, calcilutites with thin chert intercalation and nodules (radiolarians, pelagic lammelibranches, sponge spicules) and calcarenites. Limestone with *Galleanella tolmmanni* and few other foraminifera were found in the lower part of this sequence. Sedimentation was interrupted (Lower Liassic events) by an episode of graded bed (*G. tolmmanni* in one clast) and very coarse breccia with large Triassic limestones clasts. The Liassic sequence about 2 metres thick, consists of calcilutites with nodules and chert intercalations, few thin marly lamina, resedimented calcarenites and microbreccias. The resedimeted limestones contain *A. martana, I.farinacciae, M.* cf. *croatica, M. izjumiana, Glomospira* (Pl. 4, Figs. 1–11) small trocholinas, textularform foraminifera and different metazoan and algal debris; some beds also contain small micritic intraclasts with sparse radiolaria or unclear organogenous detritus. The microbreccias contain different intraclasts with radiolaria, sponge spicules and peloidal limestones in partly recrystallized matrix (Fig. 1). The sedimentation was newly interrupted (Dogger events) by very coarse breccia, large clasts (up to tens of cm) that include those of Liassic limestones, one with *Involutina liassica*.

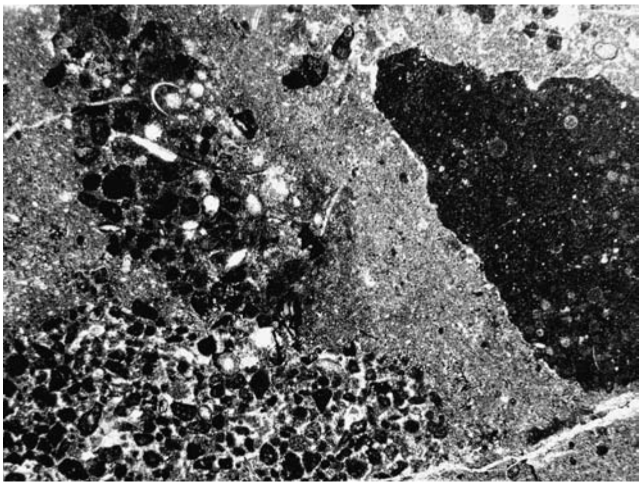

Fig. 1. Microbreccia from the Liassic sequence of the Verige Section.

The tests of *I. farinacciae* (forms A and B, D = 0.297–0.396 mm, thickness of test 0.138–0.247 mm, 4–6 whorls) are commonly poorly preserved, they are more or less recrystallized and not infrequently barely recognizable.

A Liassic sequences similar in lithology and thickness to that of Verige, are Liassic sequences of the Crisanti succession (Sicily) and the Koziakas of Pindos, Greece (a clast bearing *G. tolmmanni* is also from Lower Liassic breccia – Fig. 2).

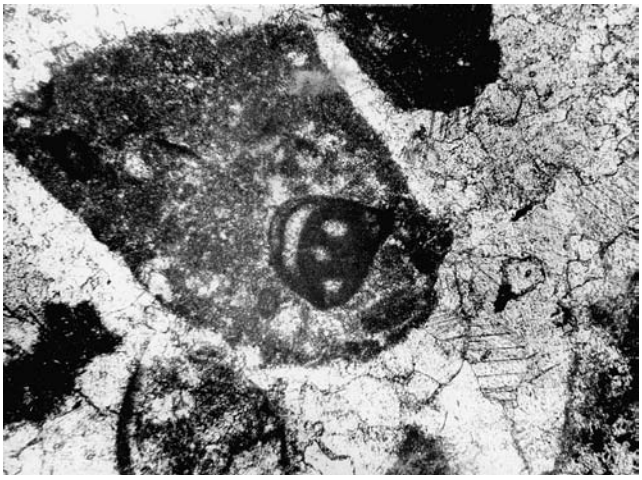

Fig. 2. The clast of the Triassic limestone with *Galleanella tolmma*nni in the Liassic breccia of the Koziakas succession, Pindos, Greece.

The Liassic sequence of Vrmac–Verige Belt, the inner distally-proximal succession, is the time or nearly the time equivalent of the "Passée Jaspeuse" Unit *sensu* GORIČAN (1994), from which partly differs in lithology because described "Passée Jaspeuse" is based on the succession in one of subaxial basin belts.

Donja Lastva succession

Part of the axial Donja Lastva succession, older than the sediments with *I. farinacciae*, is not well exposed. In the limestone, estimated at a few tens meters lowerward, the early Liassic species *Involutina turgida* occurs (KRISTAN–TOLLMANN & COLWELL 1992). *I. farinacciae* is associated with *A. martana, ?Mesoendothyra* and some other small foraminifera. Upward (not measured) in the laterally outcropped resedimented ooidal limestone, Aalenian–?Bajosian *Gutnicella cayeuxi* occurs.

The discussion concerning the paleogeography of Montenegro–Albania border region (the Scutari–Peć Lineament)

SUESS (1901) defined the Dinarides as a mountain chain extending from the south of the Eastern Alps, along the Adriatic and Ionian Seas and across the Aegean Sea, to the Taurides in Turkey. CVIJIĆ (1901) described a mild deviation of the Dinaric fold structures from NW to SE to E and NE, beginning from Njeguši to Scutari and further northward (the Dinaric Carbonate Platform! area). The name of the phenomenon "'Scharung" was borrowed from E. Suess, who used it to designate an identical structural feature (CVIJIĆ 1901, p. 106). The name Dinarides (CVIJIĆ 1924, p. 107) was used only for the Dinaric Mountain System extending to "the known deviation at Scutari", where the Dinaric and the Pindos System are in "collision". KOBER (1929) also suggested that the transversal line Scutai–Peć separates the Dinarides from the Helenides. According to CVIJIĆ (1924, fig. 88: cusp; Fig. 3), two outhers Dinaridic units are not involved by "collision": the Adriatic Carbonate Platform (ACP) that continues from Montenegro throughout Albania (Kruja) and Greece (Gavrovo) and the basinal Budva–Krasta Unit. Numerous publications, however, ignore this information and designate the Adriatic Carbonate Platform and the Budva Basin, as Dinarides and their prolongation in Albania, as Helenides.

The paleogeography of this area of the Dinarides formed on the inherited tectonic potentially active prealpine pleogeographic scenario which resulted in a different arrangement of the paleogeographic units westward and eastward of a paleostructure, that controlled the geological history of the region (for neotectoonic activity see KISSEL *et al.* 1995; MAROVIĆ & DJOKOVIĆ 1995)

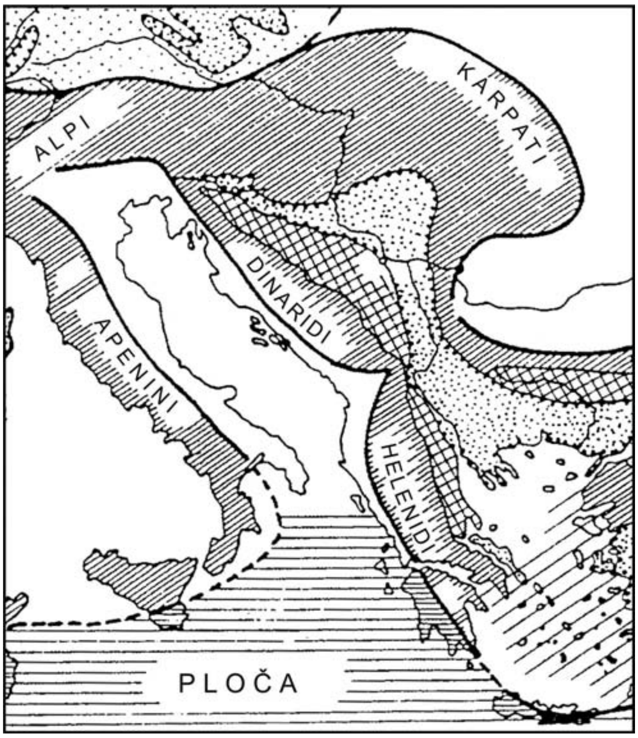

Fig. 3. The cusp between Dinarides and Helenides, from CVIJIĆ (1924, part of fig. 88).

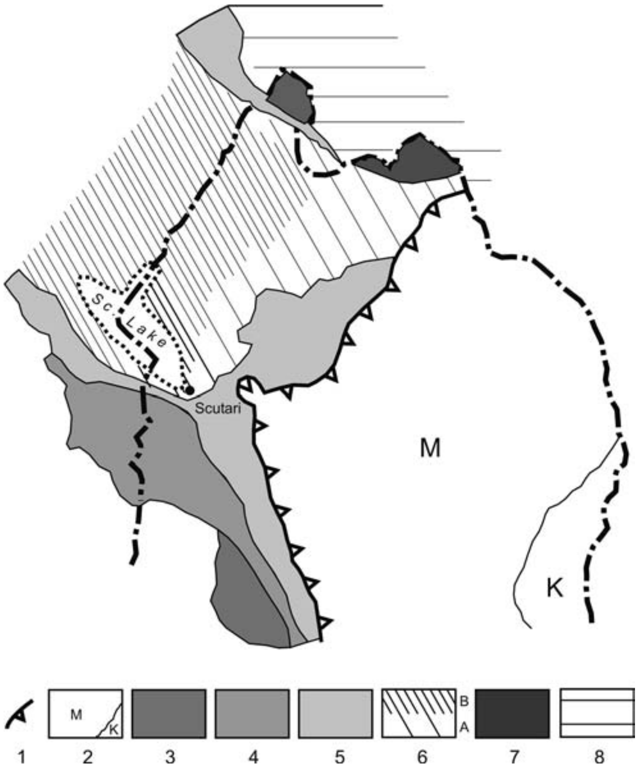

Fig. 4. Paleogeographic units in the Montenegro–Albania border region. Simplified according Geological Map of Albania, 1: 500 000; Geological Map of Albania in DURMISHI *et al.* (2010); Geological Map of SFRJ 1:500 000. Legend: **1,** Overthrust of the Complex Mirdita Zone; **2,** Complex Mirdita Zone (M) and Korab Zone (K); **3,** Ionian Zone; **4,** Adriatic Carbonate Platform – Kruja Carbonate Platform; **5,** Basins: Budva–Krasta, with NE branch Cukali (facing DCP) and South Durmitor Basin. The particularity in the sedimentary evolution of those basins depends of their position in the passive margine; **6,** Dinairc Carbonate Platform, terminal features in Albania: Malesia Madhe Subzone (platform facies) and Valbona Subzone (slope deposits, the transitional platform-basin and partly proximal Cukali successions; **7,** Gashi Zone; **8,** North Durmitor–Albanian Alps (Prokletije) Carbonate Platform.

The Dinaric Carbonate Platform ("High Karst") extends over 650 km from the Friuli–Slovenia to the Montenegro–Albania border (RADOIČIĆ 1984; RADOIČIĆ & D'ARGENIO 1999). The eastern end of the Platform in NW Albania is named the Albanian Alps Zone, composed of the Malesia Madhe Subzones (platform facies) and the Valbona Subzone which "extends in the environs of Malesia Madhe Subzone and, during the Jurassic and the Cretaceous, is represented by slope deposits connecting the Malesia Madhe carbonate platform with the Cukali and Kelmendi troughs" (PEZA 1994). The Valbona Subzone also includes the proximal successions of the Cukali Basin (THEODHORI *et al.* 1993; XHOMO *et al*. 1969: fide PEZA 1994). Albanian Alps Zone is a paleogeographic terminal feature of this large carbonate unit. The deviation of the fold structures ("Scharung") in the SE segment of the Dinaric Carbonate Platform fitted the morphology of the broad platform front cast by a major feature of the inherited Paleozoic basement. According to Albanian geologists, in the Albanian Alps Zone a deep minimum of the Bougeur amomaly is identfied "which continues uninterruptedly in the High Karst Zone in Dinarides" i.e. that are direct continuation "even in deep part" (LUBONJA *et al.* 1994).

The Basin around the DCP, known as the Krasta Basin throughout Albania, extens into Montenegro under the name Budva Basin, and near Scutari to the NE in a branche named the Cukali Basin (facing DCP) deviates even more into the South Durmitor Basin (RADOIČIĆ 1984; RADOIČIĆ & D'ARGENIO 1999) or Kelmendi which is continuous with the South Durmitor Basin (PEZA 1987; 1994, fig. 1 = Bonsniac Zone).

Durmitor Zona or South Durmitor Basin (?Triassic, Jurassic–Paleogene–?Miocene): Durmitor Flysch is the name given by BEŠIĆ (1940, 1948); The Durmitor Flysch zone renamed by Blanchet into the Bosnian Zone, an overthrusted carbonate platform is named Durmitor Zone (BLANCHET 1966; BLANCHET *et al.* 1969). To avoid confusion, and with respect to the first given name and to the geographic position, a compromise is suggested: to give the name South Durmitor Basin to the basinal unit, and the name North Durmitor–Albanian Alps Carbonate Platform to the large carbonate unit (RADOIČIĆ 1984; RADOIČIĆ &

D'ARDENIO 1999). A new name "Sarajevo Sygmoid" was introduced by DIMITRIJEVIĆ (1974, 1997). In the interpretation of Dimitrijević, this basinal unit involves a large part of the SE segment of Dinaric Carbonate Platform (sic!).

The North Durmitor–Albanian Alps Carbonate Platfotrm (ND–AACP, Permian–uppermost Tithonian) was reduced by the Liassic event; the late Cimmeria – late Tithonian events caused subsidence that led to subsequent "flysch"-carbonate clastic sedimentation in the late Tithonian–Berriasian (exposed in the Ljubišnja–Durmitor–Sinjajevina segment: RADOIČIĆ 1961, 1966; RAMPNOUX & FOURCADE 1969). The platform tectonic ends at the N and W rim of the Metohija Depression, and at the Scutari–Peć Lineament south of Peć (ANTONIJEVIĆ *et al.* 1968, 1978; SILO *et al.* 2010). Durmitor, both the basin and the platform, had sedimentary evolution to the late Jurassic characteristic for a passive margin, hence taken as Externides–Internides transitional units.

The Gashi Zone (Paleozoic basement of the ND–AA Carbonate Platform) exposed between Durmitor–Kelmendi Zone and overthrust ND–AA Carbonate Platform, consists of four Paleozoic formations (Lower Silurian to Upper Permian) and presumably Lower Triassic conglomeratre-sandstone quartzite formations (HOXHAJ 1996).

The Scutari–Peć Lineament is "a most prominent deep transversal fracture, which separates the northern Albanides (the Dinarideds of Yugoslavia) from the sourhern Albanide (the Helenide in Greece)" (LUBONJA *et al*. 1994; *DURMISHI et al*. 2010). Long after Cvijić, this feature was considered as a nucleus in the Scutari area, in addition it was interpreted as line accross the DCP from Scutari or even SW from Scutari in some recent publication (PAMIĆ & HRVATOVIĆ 2003; ZELILIDIS *et al.* 2003). The inference based on different geological maps and sketches is that this transverse paleostructure was (a) coincident with the paleogeographic front of the DCP and (b) the westward overthrust limit and deviation of the Mirdita Zone that covers a large part of the Cukali–Kelmendi Basin (SILO *et al.* 2010, fig. 2; DURMISHI *et al.* 2010, fig. 1). The differences in the alpine paleogeographic features in the prolongation from the DCP throughout Albania, controlled by paleostructure, are the source of seizmicity, rotation and deviation (SE to NW, into NE) of the Complex Mirdita Zone.

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Резиме

Involutina farinacciae BRONNIMANN & KOEHN-ZANINETTI маркер за средњи лијас басенских и неких платформних фација у областима Медитерана и Блиског Истока; дискусија о палеогеографији граничне области Црна Гора–Албанија (Скадар–Пећ линија)

Нову врсту *Involutina farinacciae* описали су BRONNIMANN & KUEHN-ZANINETTI на основу примјерака из средњег лијаса Умбрије (Италија), које је A. Farinacci приказала као врсту *Semiinvolutina clari* KRISTAN. Синоними ове нове врсте су *Aulototortus regularis* ZUCCARI и *Involutina scandonei* RADOIČIĆ, које

су описане исте године, али у радовима који су доцније публиковани.

Ова ситна *Involutina* најчешће је слабо очувана, мање или више прекристалсала, а јавља се у реседиментним ооидно-пелоидним карбонатима поменутих басенских и платформних ареала.

Ирачки Кутрдистан: Карбонатно кластичне сукцесије јуре и креде Авроман области ирачког Курдистана, сличне су сукцесијама Будва и Пиндос Басена. *Involutina farinacciae* нађена је у лијаским секвенцама у пет локалитета.

У унутрашњим Динаридима лијаски седименти са *I. farinacciae* распрострањени су у СИ и ЈИ дијелу Офиолитског масива Златибора као и у области Сјенице и између Сјенице и Пријепоља. Ооидно-пелоидни кречњаци, дијелом силификовани и/или са рожнацима, у којима је јавља *I. farinacciae*, према геолошким картама листова Ужице, Сјеница и Пријепоље, приписани су "Дијабаз рожначкој формацији". Уствари, они претстављају само дио засада неименване вјероватно горњотријаско–лијаске формације.

Седименти са *I. farinacciae* на простору Динарске карбонатне платформе познати су у Словенији (СЗ сектор ДКП) и Црној Гори (ЈЗ сектор ДКП).

У Словенији, поред познатих локалитета Потпеч (RADOIČIĆ 1987) и Ковк (ČRNE & GORIČAN 2009) сада је забиљежен и налазак слојева са *I. farinacciae* у прелазним платформа–басен седиментима код жељежничке станице Авче.

У Црној Гори, слојеви са *I. farinacciae* депоновани су у благој депресији (источно и западно прелазе у слојеве са литиотисима) дуж трансверзалне линије Бока Которска–Гацко. У профилу између Грахова и Вилуса, *I. farinacciae* је нађена у неколико узорака у стубу од око 35 метара. Око 20 метара испод прве појаве *I. farinacciae* забиљежен је налазак доњолијаске врсте *Involutina turgida* KRISTAN.

Будва басен. У Црногрском приморју, између Динарске и Јадранске карбонатне платформе (ЈКП) прате се различите сукцесије интраконтиненталног Будва басена (горњи перм–горњи миоцен). То су различите сукцесје како интерног проксималног, аксијалног, субаксијалног и екстерног проксдимално-субаксалног појаса.

У овим сукцесијама јасно се очитава интрабасенска и платформа-басен тектонска активност различитог степена и ефеката, која је, у неким интервалима интензивнија (средњи тријас, рето-лијас, кимериџ-беријас, средња креда, кампан и др). Западно од Боке Которске Будва басен се прати до Зубачког расједа, гдје се губи под Динарском карбонатном платформом ("Високи крш").

Секвенце лијаских седимената Будва басена са *Involutina jarinacciae* (око 20 до 30 m дебљине) засада су познате у сукцесијама Врмац–Вериге, Доња Ластва, Девесиље, Косљун, Мељине, Банићи и Буљарица–Чањ.

Палеогеографија граничне области Црна Гора–Албанија: ЦВИЈИЋ (1901, 1924) описао је скретање динарског правца набора код Скадра *"Scharung"*. Стога се дуго након ЦВИЈИЋА, а каткада и у новије вријеме, подручје Скадра узима као нуклеус трансверзале Скадар–Пећ. Према ЦВИЈИЋУ (1924, сл. 88: cups; сл. 3), ова трансверзална структура не обухвата двије палеогеографске јединице екстерних Динарида, што се у бројним публикацијама игнорише.

Палеогеографија ове области Динарида формирана је на наслијеђеном тектонски потенцијално активном преалписком палеогеографском сценарију, што је условило различит распоред палеогеографских јединица западно и источно од палеоструктуре, која је контролисала геолошку историју региона. Значајна разлика је што се у СЗ Албанији завршава крупна палеогеографка јединца – Динарска карбонатна платформа.

Бројни радови претежно албанских аутора, геолошке карте и скице упућују на закључак да ова трансверзална палеоструктура подудара) са палеогеографским (а не тектонским) завршетком Динарске карбонатне платформе и б) западном границом навлаке и девијацијом навлаке Мирдита зоне која покрива знатан дио Цукали–Келменди басена (SILO *et al.* 2010; DURMISHI *et al.* 2010). Разлика у алпиској палеогеографској слици у продужењу од ДКП кроз Албанију, контролисана палеоструктуром, повод је сеизмицитета, ротације и девијације (ЈИ–СЗ у СИ) комплексне Мирдита Зоне.

PLATE 1

Liassic of the Zlatibor Mt. and Sjenica–Prijepolje area.

Figs. 1–5. *Involutina farinacciae* BRONNIMANN & KOEHN-ZANINETTI.
1. Drežnik, NE Zlatibor, Drežnik, thin section RR5090.
2, 3. S of Sjenica, on the road to gomila, thin section RR5094.
4. Duboki potok, between Aljivovići and Prijepolje, thin section RR5117.
5. Gomila, thin section RR5096 .

Figs. 6, 7. *Bosniella* cf. *oenensis* GUŠIĆ, Gomila, thin section RR5096; Vrelo, thin section RR5157.

Fig. 8. Genus?, Duboki potok–Aljinovići–Prijepolje, Lower Dogger?, thin section RR5126.

Fig. 9. *Mesoendothyra croatica* GUŠIĆ, Duboki potok, Aljinovići–Prijepolje, Dogger?, thin section RR5126.

Fig. 10. *Agerina martana* (FARINACCI), Vrelo, thin section RR5157.

Fig. 11. Genus?, Vrelo, thin section RR5157.

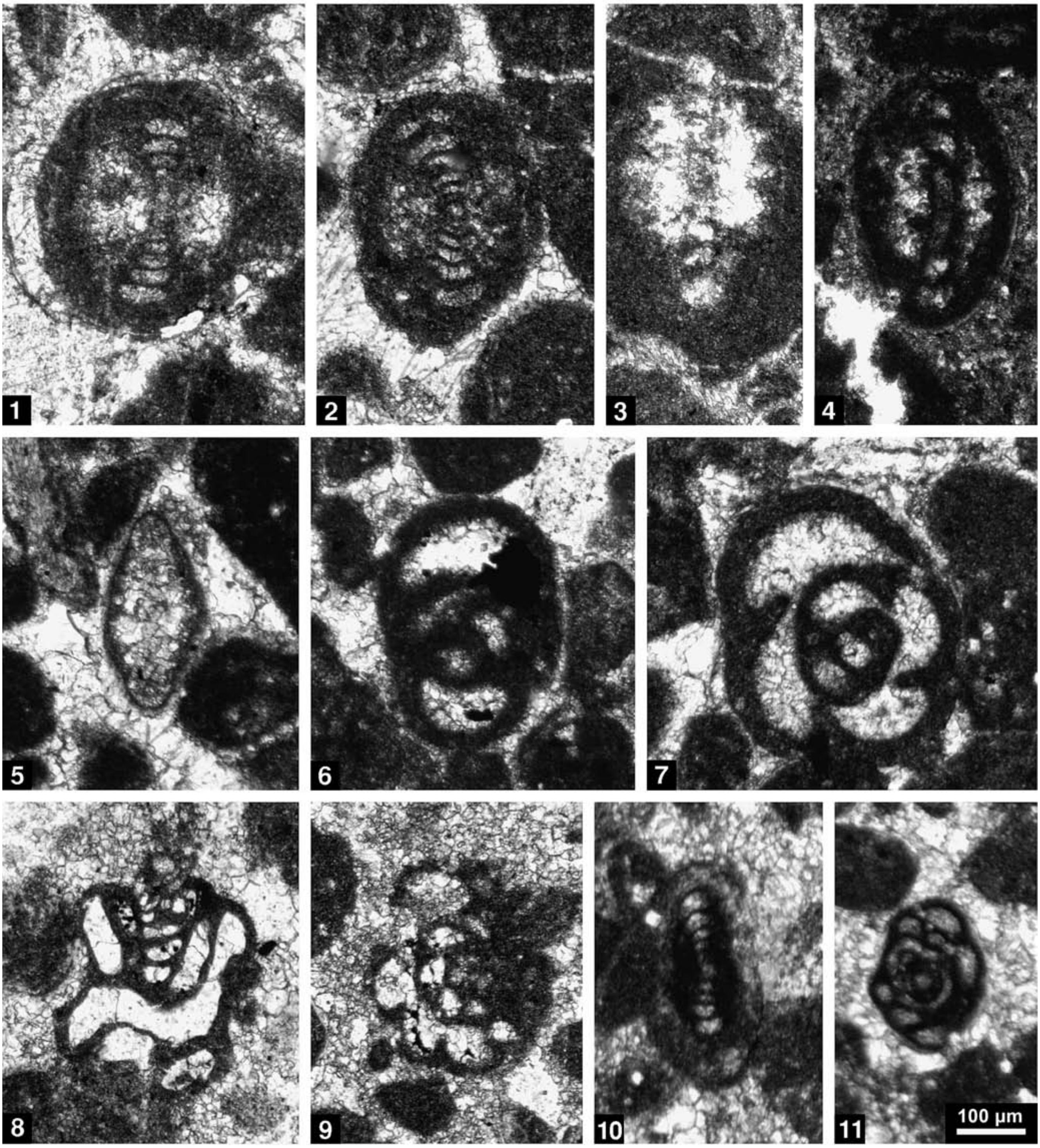
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PLATE 2

Figs. 1–11. Liassic of Avče, Slovenia,

Figs. 1–4. *Involutina farinacciae* BRONNIMANN & KOEHN-ZANINETTI, thin sections RR3230 and 3229.
Figs. 5–8. *Mesoendothyra croatica*, thin section RR 3230 and 3231.
Fig. 9. *Agerina martana* (FARINACCI), thin section RR3229.
Fig. 10. *Agerina martana* (FARINACCI), Verige, succession, thin section RR7293.
Fig. 11. Genus? "A1", thin section RR3231.
Fig. 12. Textulariformn foraminifer, thin sectiom RR3231.

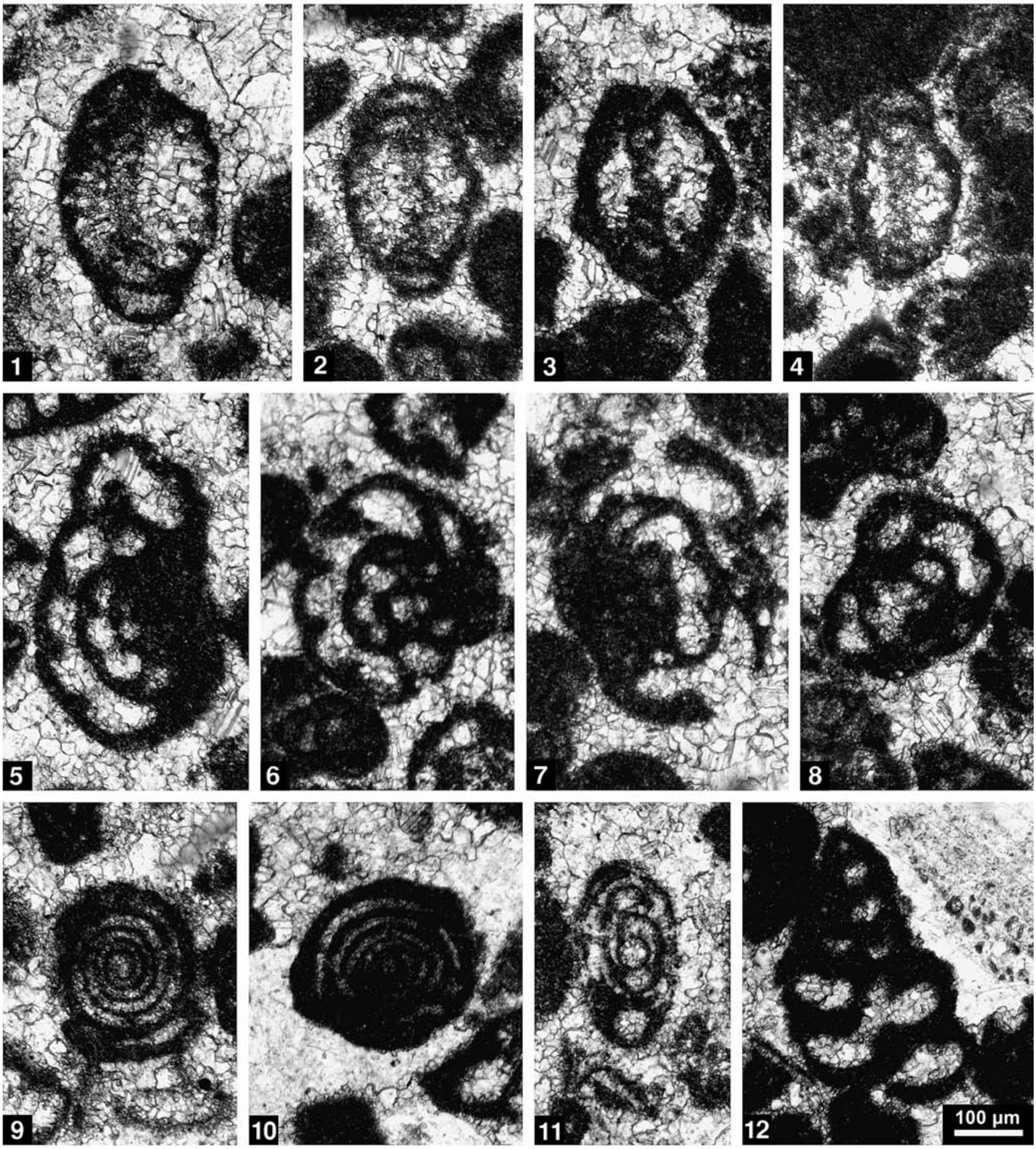
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PLATE 3

Figs. 1–9. Liasic of Viluse sequence, Dinaric Carbonate Platform, Montenegro.
1–6. *Involutina farincciae* BRONNIMANN & KOEHN-ZANINETTI, thin sections RR7233, 7234, 7234/1.
7. *Agerina martana* (FARINACCI), thin section RR 7234.
8. Sponge spicules, thin section 7231.
9. *Involutina turgida* KRISTAN, thin section RR7229.

Fig. 10. *Involutina liassica* (JONES) and lagenid from middle-upper Liassic of the Vojnik Mt. (some metres bellow limestone with *Hildoceras bifrons*), thin section RR 7245.

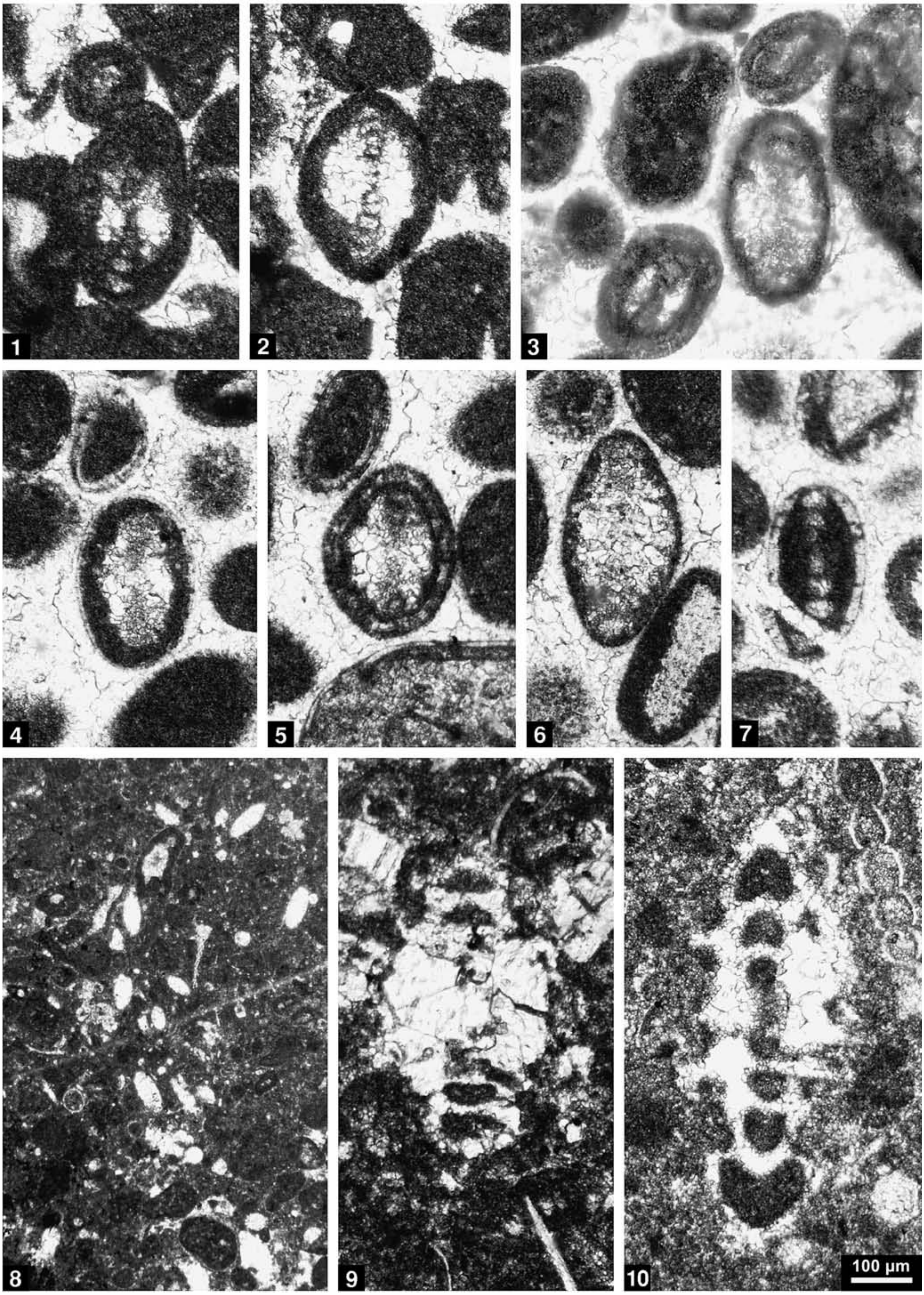
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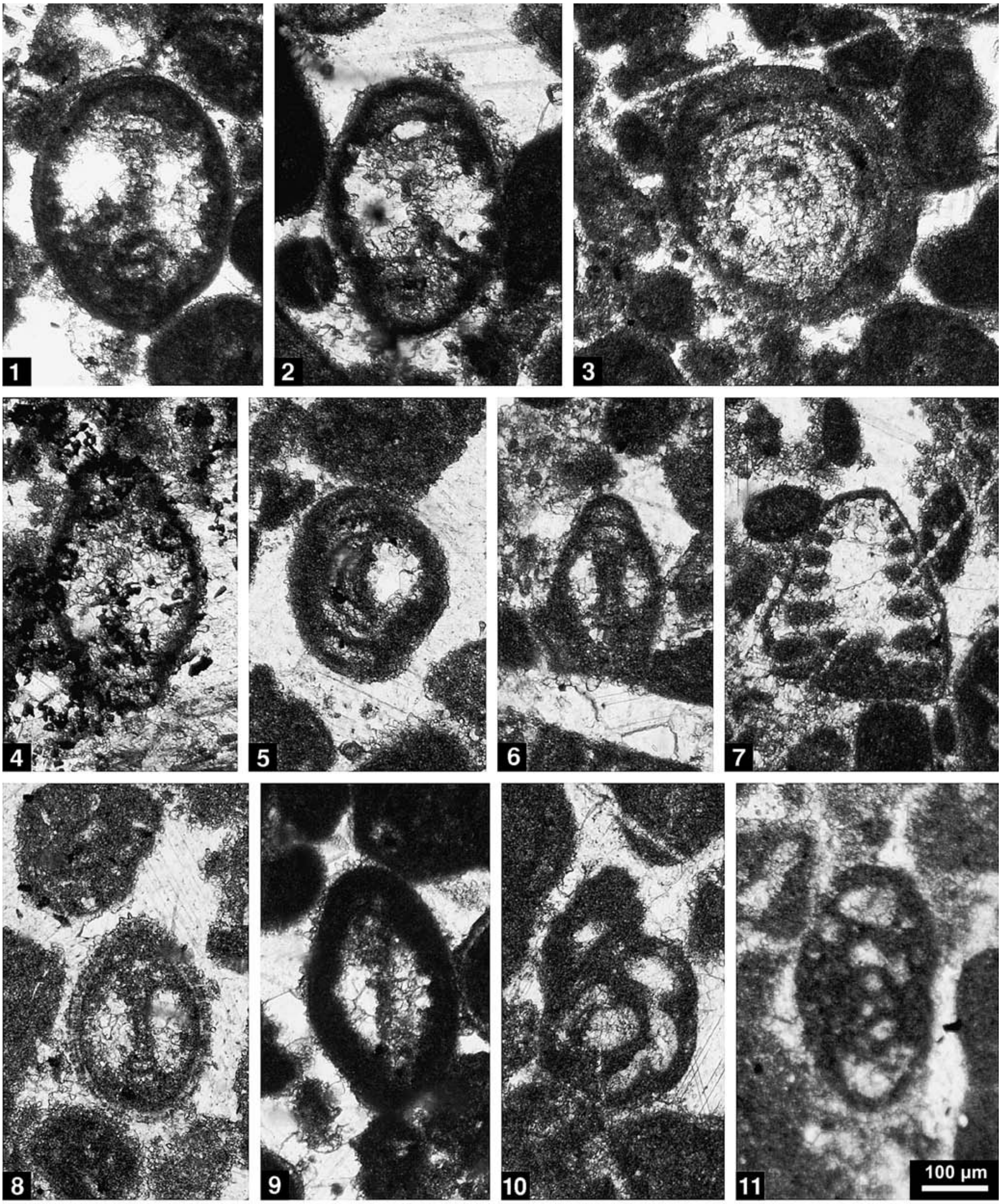
PLATE 4

Figs. 1–11. Liassic sequence of the Verige succession.

Figs. 1–6, 8, 9.	*Involutina farinacciae*, thin sections RR7293 (1–4, 9), 7291 (5–6), 7294 (8).
Fig. 7.	*Trocholna* sp., thin section RR7291.
Fig. 10.	?*Mesoendothyra* sp., thin section RR7291.
Fig. 11.	*Mesoendothyra izjumiana* DAIN, thin section 7296.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