Epigondolella abneptis (Huckriede), *Epigondolella postera* (Kozur & Mostler), and *Norigondolella steinbergensis* (Mosher) (samples MS 1724); *Epigondolella abneptis* (Huckriede), *Epigondolella postera* (Kozur & Mostler) and *Norigondolella* cf. *hallstattensis* (Mosher) (sample MS 1726). or *Norigondolella* cf. *steinbergensis* (Mosher) (sample SRB 311). Interestingly the older components occur in a higher position of the succession. This proves a step by step erosion and resedimention of the original sequence. The radiolaritic matrix is dated by means of radiolaria. Following taxa proves a Callovian to Middle Oxfordian age: *Archaeodictyomitra mitra* Dumitrica in Dumitrica et al., *Archaeodictyomitra rigida* Pessagno, *Archaeodictyomitra* sp. B sensu Wegerer et al., *Droltus galerus* Suzuki, *Eucyrtidiellum unumaense* (Yao), *Eucyrtidiellum nodosum* Wakita, *Gongylothorax favosus* Dumitrica, *Hsuum brevicostatum* (Ozvoldova), *Hsuum maxwelli* Pessagno, *Loopus doliolum* Dumitrica, *Praewilliriedellum spinosum* Kozur, *Praezhamoidellum* cf. *parvipora* (Tan), *Stichocapsa robusta* Matsuoka, *Striatojaponocapsa conexa* (Matsuoka), *Striatojaponocapsa synconexa* O'Dogherty et al., *Tricolocapsa* aff. *fusiformis* Yao, *Tricolocapsa* sp. C sensu Auer et al., *Williriedellum dierschei* Suzuki & Gawlick.

Hallstatt Limestone successions are only known from the distal passive Europaean (or Adria) margin facing the Neotethys Ocean to the east. The clasts and slides of the mélange in the area of Vodena Poljana derive therefore from the outer shelf region and resemble the known situations in the Eastern Alps or the Albanides. The situation resembles of the Bathonian to Oxfordian Sandlingalm Formation (Hallstatt Mélange) in the Northern Calcareous Alps (Gawlick et al. 2009) and equivalents in the Western Carpathians or Albanides. The Hallstatt Mélange is interpreted to be formed in front of advancing nappes, formed in the outer shelf region due to the onset of ophiolite obduction in the Middle Jurassic, confirmed in the Inner Dinarides by the overlying ophiolitic mélange in the Zlatar Mountain. These nappes propagated during Middle to Early Late Jurassic from the outer to the inner shelf area (Late Triassic carbonate platform) forming a thin-skinned thrust belt.

We consider therefore westward transport of the carbonate-clastic Hallstatt Mélange, the ophiolitic mélange and the ophiolite nappes from the Neotethys realm. An autochthonous origin of a Triassic Ocean (Dinaridic or Pindos Ocean) between the Outer Dinarides and the Drina-Ivanjica Unit to the east as northward continuation of Pelagonia/Korabi Units can be excluded. This ocean would have existed in the lagoonal area of the Triassic carbonate platforms in the Dinarides, separate for example in Late Triassic times the restricted lagoon (Hauptdolomit) from the open lagoon (lagoonal Dachstein Limestone).

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Age and provenance of the Dinaridic Ophiolite Belt in the Zlatibor area (SW Serbia)

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The Dinaridic Ophiolite Belt of western and south-western Serbia is made of ophiolites and widespread mélanges containing different components up to nappe-size, interpreted as radiolaritic-ophiolitic trench fills in front of advancing nappes. Matrix ages of the different mélange complexes are very rare, but play a crucial role in the reconstruction of the formation and emplacement of the ophiolite nappes. From the radiolaritic matrix between different ophiolite, radiolarite and rare carbonate blocks of the ophiolitic mélange in the Zlatibor area (localities: **A.** south of Trnava in the valley of Katusnica River, **B**. south of Ljubis in one double road curve in direction to Gornja Bela Reka, and **C**. east of Ljubis near Visoka) we isolate radiolarians of Early Callovian to Middle Oxfordian age on locality A with *Archaeodictyomitra* cf. *rigida*, *Eucyrtidiellum* cf. *unumaense*, *Gongylothorax* cf. *favosus*, *Williriedellum dierschei*, and *Tritrabs* sp. (sample SRB 216); and on locality B with *Archaeodictyomitra rigida, Archaeodictyomitra* sp., *Eucyrtidiellum unumaense*, *Eucyrtidiellum unumaense unumaense*, *Gongylothorax favosus*, *Gongylothorax* sp. C, *Helvetocapsa* cf. *matsuokai*, *Praezhamoidellum* aff. *buekkense, Striatojaponocapsa conexa*, *Striatojaponocapsa* sp., *Theocapsomma* cf. *cucurbiformis*, *Theocapsomma medvednicensis*, *Theocapsomma* sp., *Unuma latusicostatus*, *Unuma* cf. *gordus*, and *Williriedellum dierschei* (sample SRB 240). In both regions therefore the age of the mélange can be dated as Early Callovian to Middle Oxfordian, and belong to the same mélange belt. Blocks of ribbon radiolarites in the mélange are of Middle and Late Triassic age; indicated by bad preserved Capnuchosphaeridae and Muelleritortiidae (sample SRB 212, locality A). Late Ladinian to Early Carnian radiolarites are dated by *Ditortis recskensis* and *Muelleritortis* sp. (sample SRB 405, locality C). Carnian radiolarites (locality A) are proven by *Nakesekoellus* sp., *Triassocampe* cf. *sulovensis*, *Spinotriassocampe* sp., ?*Yeharaia* sp, and ?*Capnuchosphaera* sp. (sample SRB 215) Norian radiolarites are dated with Capnuchosphaeridae, ?*Sarla*. sp. and *Livarella* sp. (sample SRB 214, locality A). These Triassic radiolarites are interpreted to derive from the sedimentary cover of the Neotethys oceanic crust. Therefore the age of the reworked oceanic crust must be slightly older than the youngest radiolarite component, i.e. Middle Triassic. A derivation from the Middle Triassic volcanics, which occur widespread in the Dinaridic realm, can be excluded. These Middle Triassic volcanics are covered by Late Ladinian and Late Triassic shallow-water carbonates, missing in the clast spectrum of the mélange. Also these volcanics are age restricted to two independent events, one in the Late Anisian (Illyrian) and one in the early Langobardian.

According to this radiolarian data the age of this radiolaritic-ophiolitic mélange (Zlatibor ophiolithic mélange) corresponds to the age of the Sjenica ophiolitic mélange further south (Gawlick et al. 2009). Also the component spectrum is similar. The whole mélange succession in the area between Trnava/Ljubis and Gornja Bela Reka is interpreted to be a primary sedimentary synorogenic radiolaritic trench-fill sequence that formed simultaneously with ophiolite nappe stack/emplacement and later ophiolite obduction/accretion. This originally sedimentary trench fill is overprinted by contemporaneous and younger tectonics forming a typical mélange. It was deposited during the late Middle to early Late Jurassic period contemporaneous with ophiolite nappe thrusting in the Neotethys realm. The depositional area could be interpreted to have been a deep-water trough in front of advancing ophiolite nappes.

Of special interest is also the overlying mélange sequence, which consists of different carbonate blocks of Triassic age, of both deep-water and shallow-water origin derive from an outer carbonate shelf position, as proven by facies analysis and conodont dating. The carbonatic mélange in the Sirogojno area is relatively matrix-free, only in some fissures in lagoonal Dachstein Limestone blocks remnants of the matrix (radiolarites, ophiolite components) are preserved. This resembles the situation in Krs Gradac near Sjenica, where a Middle to early Late Jurassic radiolarite matrix with Triassic radiolarite components occur between blocks of lagoonal Dachstein Limestone, here proven by means of radiolarians. The carbonate-clastic mélange topped the ophiolitic mélange and seems to be of similar age range. The provenance area of the Triassic shallow- and deep-water carbonate blocks should be the Drina-Ivanjica Unit high further to the east, where they should have formed the original sedimentary cover (Dimitrijevic 1997). But these clasts and kilometre-sized slide blocks derive from a carbonate platform area facing the Neotethys Ocean to the east. Hemipelagic limestones (e.g., Hallstatt Limestones) from the outer shelf area, which was located originally further to the east, are missing in this mélange. We consider therefore westward transport of the ophiolitic mélange and the ophiolite nappes as well as westward transport of the carbonatic mélange on top. Westward directed ophiolite obduction and thrusting in Jurassic times occur widespread in the Dinaridic-Albanide realm, but the exact age of the emplacement is still a matter of controversial discussion: Middle to early Late Jurassic or latest Jurassic to earliest Cretaceous. Our new data confirm (a) an allochthonous derivation of the ophiolitic mélange and the overlying ophiolite nappes (westward obduction), (b) the Middle to early Late Jurassic formation of the radiolaritic-ophiolitic mélange in the Dinaridic Ophiolite Belt, and (c) their westward transport in late Middle to early Late Jurassic times. A younger, second westward thrusting phase is documented by underlying radiolarite sequences with intercalated shallow-water debris of Kimmeridgian to Tithonian age, in both regions, e.g., in the village Ljubis and on locality B in the area of the Zlatibor ophiolithic mélange and near Krs Gradac in the area of the Sjenica mélange. In both regions these occurrences are tectonic windows below the overthrusted ophiolitic and carbonatic mélanges (with exception of the Hallstatt Mélange, which is below the ophiolithic mélange and the ophiolite nappes). Therefore both mélanges occur in the same tectonic position. This clearly shows a polyphase thrusting of the ophiolithic mélange, the ophiolite nappes as well as the carbonate-clastic mélange in westward directions. An autochthonous origin of a Triassic Ocean (Dinaridic Ocean or Pindos Ocean) between the Outer Dinarides and the Drina-Ivanjica Unit as northward continuation of Pelagonia/Korabi Units, as proposed by another group of authors (e.g., Stampfli & Kozur 2006, Robertson et al. 2009), can be excluded. This ocean would have existed in the lagoonal area of the Triassic carbonate platforms in the Dinarides, separate for example in Late Triassic times the restricted lagoon (Hauptdolomit) from the open lagoon (lagoonal Dachstein Limestone). Hemipelagic Triassic sediments, which should have formed the passive margins facing this ocean, are missing in this position. The situation in the Dinaridic Ophiolite Belt corresponds perfectly to the situation known further to the south in Albanides, where the obducted Mirdita Ophiolites and accompanying radiolaritic-ophiolitic mélanges were formed in Middle to early Late Jurassic times. Both regions belong therefore to the same belt of obducted ophiolites, which derive from the same oceanic domain further to the east, which started to form in Late Anisian. Inneroceanic subduction started in late Early Jurassic times and westward obduction in late Middle Jurassic.

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Starvation when everywhere else was plenty: Was the northern Penninic Ocean an inhospitable desert during OAE 2?

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The oceanic anoxic event at the Cenomanian-Turonian boundary (OAE 2) led to different, usually organic rich, sedimentary successions in various parts of the world. In order to trace the paleoceanographic processes at the northern Tethyan margin, we investigated samples from the unique Rehkogelgraben section in the Eastern Alps. Paleoecologic conditions were reconstructed for strata before, during and after OAE-2 by combining the results of assemblage counts of indicative microfossil groups from planktic (foraminifera, radiolaria) and benthic (foraminifera) realms. Microfossil assemblages, size distributions and accumulation rates show a tripartite subdivision for surface and bottom waters. They indicate oligotrophic surface conditions and oxic bottom waters with a reasonably high food supply for the late Cenomanian interval. The OAE period with black shale deposition is characterized by very low numbers but relatively high diversities and a lack of high productivity indicators among planktic foraminifera. Benthic foraminifera show extremely low accumulation rates and are all of small size, pointing to low oxic or dysoxic conditions at the sea floor. Post-OAE assemblages are characterized by mesotrophic planktic species and benthic foraminifera point to a reappearence of oxic bottom waters. It took about 300 Ky to re-establish a pelagic carbonate-producing regime. The Rehkogelgraben record points to unusual paleoceanographic conditions during the OAE 2. The semi-enclosed basin situation of the Penninic Ocean is thought to be responsible for the apparent differences between the high productivity in most parts of the world ocean and the overall absence of high productivity indicators in the foraminiferal assemblages at Rehkogelgraben. Our records show higher benthic and planktic foraminiferal diversities during OAE 2 compared with high productivity areas elsewhere. The Penninic Ocean may have even served as a retreat area during the environmental crisis.

Korrelation zwischen Wärmeleitfähigkeit und Kompressionswellengeschwindigkeit an magmatischen Gesteinen

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Thermische Eigenschaften sind vor allem für geothermische Projekte und Studien von besonderer Bedeutung. Ein grundsätzliches Problem besteht darin, die Wärmeleitfähigkeit aus in-situ Bedingungen zu gewinnen. Ein Lösungsansatz dafür liegt in der Korrelation mit anderen geophysikalischen Gesteinseigenschaften, vorzugsweise der seismischen Geschwindigkeit.

Für drei ausgewählte Gesteinsgruppen (Granit, Gabbro, Diorit und Basalt), aus der Lithothek der TU Graz, werden die Ergebnisse der Labormessungen von Wärmeleitfähigkeit und Kompressionswellen-geschwindigkeit dargestellt. Als Basis für die Interpretation der experimentellen Daten wurde ein 2-Stufen Model herangezogen (BERRYMAN 1995). Im ersten Schritt wurde ein Model mit den Volumenanteilen und den Eigenschaften der Minerale ausgewählt (CLAUSER & HUENGES 1995, GONG 2005, HORAI & SIMMONS 1970, NOVER et al. 1989). Dieses liefert die „Festgesteinseigenschaften“. Als zweiter Schritt wurden Risse und Inklusionen implementiert. 2 Methoden wurden angewandt:

(a) Inklusions-Model, bei dem die Formeln von BUDIANSKY & O'CONNELL (1976) sowie von Clausius-Mossotti (MAVKO et al. 1998, SEN 1981) verwendet wurden, und
(b) einfaches Model mit einem „Defekt-Parameter“, nach SCHÖN (1996).

Beide Modelle bieten eine gute Näherung der experimentell bestimmten Beobachtungen und zeigen den Einfluss der Mineralzusammensetzung und der Risse und Klüfte. Die kontrollierenden Eigenschaften bei den Inklusions-Modellen sind „aspect ratio“ und Kluftporosität. Die Korrelation bei dem „Defekt-Modell“ ist durch einen nur von den Mineraleigenschaften bestimmten Parameter A_{solid} und die defektbestimmte Korrelation $\lambda \alpha \nu_p^2$ gegeben. Die Ergebnisse liefern eine Basis für die Umrechnung von seismischen Daten in thermische Eigenschaften.

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