

RIO, D., CITA, M.B., IACCARINO, S., GELATI, R. & GNACCOLINI, M., 1997: Langhian, Serravallian, and Tortonian historical stratotypes. – In: MONTANARI, A., ODIN, G.S. & COCCIONI, R., (eds.): *Miocene Stratigraphy: an integrated approach*, 57-87, Elsevier Science, Amsterdam.

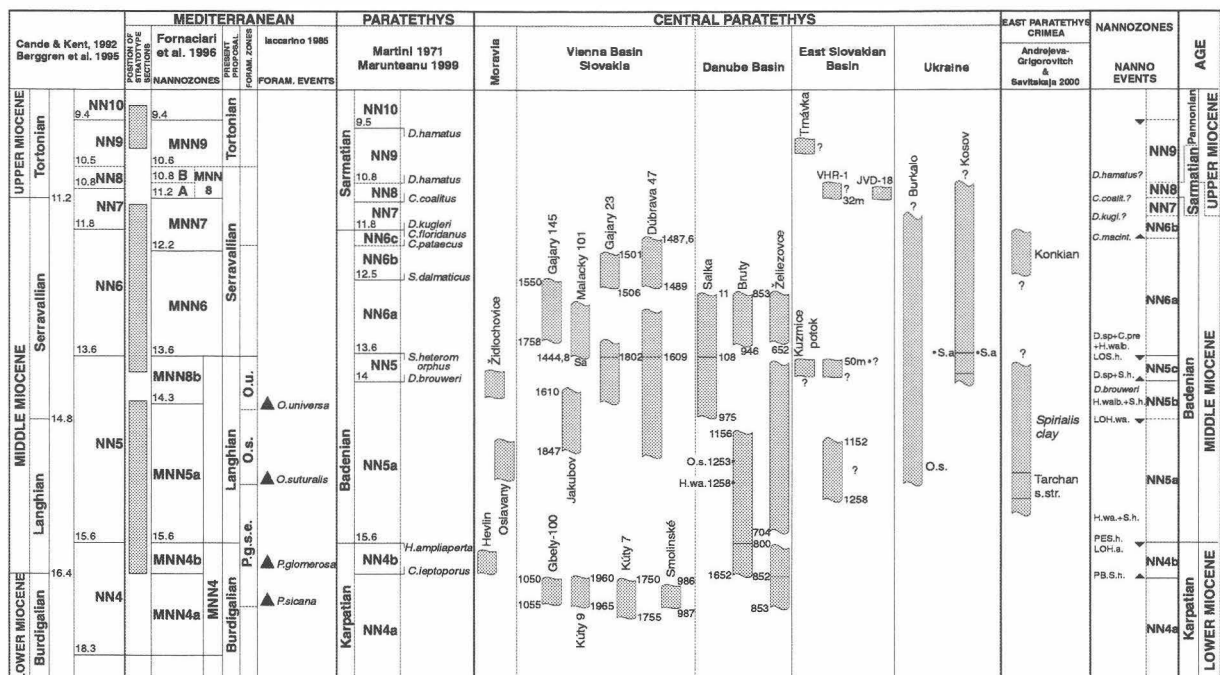
TURCO, E., FORESI, L.M., LIRER, F., IACCARINO, S. & SALVATORINI, G., 2001: Middle Miocene biostratigraphy and paleobiogeography from the Equatorial Atlantic Ocean (Leg 154, Site 926A). - *Paleobiogeography and Paleoecology 2001*, Intern. Confer. May 31- June2, 2001, Piacenza & Castell'Arquato, Italy.

## Mid-Miocene nannoplankton correlation in the Paratethys

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Nannoplankton correlations between Central and Eastern Paratethys were focussing on the two older HRI's, starting with NN4. Up to NN6 the Central Paratethys had marine conditions. As seen in Figs. 1 and 2 correlation problems between Central and Eastern Paratethys occur in NN5 up to NN8. One main problem is the correlation of NN7, Badenian or Sarmatian in the Central Paratethys. In the presented scheme NN4 represents Karpatian, NN5 Early Badenian, NN6 Late Badenian, NN7 and NN8 are placed into the Sarmatian, and NN9 into Pannonian A.



**Fig. 1:** Compilation of nannofossil zonations of the Mediterranean, Paratethys, Central Paratethys and Eastern Paratethys (after KOVÁČ et al. 2000, HUDÁČKOVÁ 1995, HUDÁČKOVÁ & SLAMKOVÁ 2000, ANDREYEVA-GRIGOROVICH & HALÁSOVÁ 2000).

TIME (ma)	EPOCH		MEDITERRANEAN			CENTRAL PARATETHYS			EAST PARATETHYS			
	MIDDLE MIOCENE		Langhian stratotype, Italy			Moravia and Austria			Crimea, Kerch p-la, Ukraine			
	LOWER MIOCENE	LANGHIAN	AGE	ZONE	SUBZONE	AGE	ZONE	AGE	BEDS	ZONE		
13,5	SERRAVALIAN		<i>H. ampliaptera</i> <i>H. waltrans</i> <i>H. walbersdorfensis</i> <i>S. heteromorphus</i> <i>D. variabilis / exilis</i> <i>C. floridanus</i> <i>R. pseudoumbilicus</i> <i>C. premacintyreii</i> <i>H. intermedia</i>	MNN 5	MNN 5b		<i>H. mediterranea</i> <i>H. ampliaptera</i> <i>H. waltrans</i> <i>H. walbersdorfensis</i> <i>S. heteromorphus</i> <i>C. leptoporus</i> <i>C. premacintyreii</i> <i>G. rotula</i> <i>D. variabilis / exilis</i>		CHOKRAKIAN		<i>H. carteri</i> <i>H. intermedia</i> <i>H. waltrans</i> <i>H. walbersdorfensis</i> <i>S. heteromorphus</i> <i>C. premacintyreii</i> <i>C. floridanus</i> <i>R. pseudoumbilicus</i> <i>R. sicca</i> <i>R. bigelowii subsp. parvula</i> <i>Profarolichia fusiformis</i>	
16,4	BURDIGALIAN			MNN 4a	MNN 4b	KARPATIAN		NN 4	KOTSIAKHURIAN	MAYKOP		
								NN 5	TARKHANIAN	TARKHAN YURAKOV s. str.		
												NN 5

**Fig. 2:** Comparison of nanoplankton zones and ranges of the most important taxa in the stratotype area of Tarkhanian deposits of Kerch peninsula (East Paratethys) and Karpatian/Badenian sediments in Moravia and Lower Austria (Central Paratethys) (In: SVABENICKA & CTYROKA 1999) and Langhian stratotype area in Italy (Mediterranean area) (In: FORNACIARI et al. 1996).

Nannoplankton association of the NN4a zone (*Helicosphaera ampliaptera*-*Sphenolithus heteromorphus*):

*Calcidiscus leptoporus*, *Reticulofenestra pseudoumbilicus*, *Helicosphaera mediterranea*, *Calcidiscus premacintyreii*, *Orthorhabdus serratus*, *Helicosphaera ampliaptera*, *Helicosphaera scissura*

Foraminiferal association of the NN4a zone:

*Uvigerina graciliformis*, *Uvigerina accuminata*, *Uvigerina pygmaea*, *Pappina primiformis*, *Pappina breviformis*, *Bolivina hebes*, *Reussella spinulosa*, *Valvulinera complanata*, *Sphaeroidina bulloides*, *Cibicides ungerianus*, *Heterolepa dutemplei*, *Nonion commune*, *Ammonia* sp., *Pararotalia aculeata*, *Protoelphidium* spp., *Elphidiella minuta* (HUDÁČKOVÁ et al. 1997)

Nannoplankton association of the NN4b zone (*Helicosphaera ampliaptera*-*paraacme Sphenolithus heteromorphus*):

*Calcidiscus leptoporus*, *Calcidiscus premacintyreii*, *Reticulofenestra pseudoumbilicus*, *Helicosphaera mediterranea*, *Helicosphaera ampliaptera*, *Helicosphaera scissura*, *Helicosphaera carteri*, *Helicosphaera walbersdorfensis*, *Helicosphaera vedderi*, *Helicosphaera intermedia*, *Orthorhabdus serratus*, *Umbilicosphaera rotula*

Nannoplankton association of the NN5a zone (*Sphenolithus heteromorphus*-*Helicosphaera waltrans*):

*Calcidiscus leptoporus*, *Calcidiscus premacintyreii*, *Coccolithus miopelagicus*, *Coronocyclus nitescens*, *Helicosphaera waltrans*, *Helicosphaera walbersdorfensis*, *Helicosphaera carteri*, *Reticulofenestra pseudoumbilicus*, *Rhabdosphaera sicca*, *Discoaster exilis*

Nannoplankton association of the NN5b zone (*Sphenolithus heteromorphus*-*Helicosphaera walbersdorfensis*):

*Calcidiscus leptoporus*, *Calcidiscus premacintyreii*, *Discoaster exilis*, *Discoaster deflandrei*, *Helicosphaera walbersdorfensis*, *Helicosphaera carteri*, *Cyclicargolithus floridanus*, *Orthorhabdulus serratus*, *Holococcolithus macroporus*, *Rhabdosphaera sicca*, *Sphenolithus abies*, *Sphenolithus moriformis*, *Coccolithus miopelagicus*, *Pontosphaera multipora*, *Hayella challengerii*

Nannoplankton association of the NN5c zone (*Sphenolithus heteromorphus*-*Discoaster brouweri*):

*Calcidiscus leptoporus*, *Calcidiscus premacintyreii*, *Discoaster brouweri*, *Discoaster petaliformis*, *Discoaster exilis*, *Helicosphaera walbersdorfensis*, *Helicosphaera carteri*, *Cyclicargolithus floridanus*, *Holococcolithus macroporus*, *Rhabdosphaera sicca*, *Sphenolithus abies*, *Sphenolithus moriformis*, *Coccolithus miopelagicus*, *Pontosphaera multipora*, *Triquetrorhabdulus rugosus*

Nannoplankton association of the NN6 zone (*Discoaster exilis*):

*Calcidiscus leptoporus*, *Calcidiscus premacintyreii*, *Sphenolithus abies*, *Sphenolithus moriformis*, *Discoaster exilis*, *Discoaster brouweri*, *Discoaster variabilis*, *Discoaster formosus*, *Discoaster challengerii*, *Reticulofenestra pseudoumbilicus*, *Rhabdosphaera sicca*, *Pontosphaera multipora*, *Triquetrorhabdulus rioi*, *Triquetrorhabdulus rugosus*, *Braarudosphaera bigelowii* (small forms)

Nannoplankton association of the NN8 zone (*Catinaster coalitus*):

*Calcidiscus leptoporus*, *Calcidiscus premacintyreii*, *Sphenolithus abies*, *Sphenolithus moriformis*, *Reticulofenestra pseudoumbilicus*, *Rhabdosphaera sicca*, *Pontosphaera multipora*, *Braarudosphaera bigelowii* (small forms), *Helicosphaera carteri*, *Helicosphaera intermedia*, *Scyphosphaera lagena*, *Umbilicosphaera rotula*, *Umbilicosphaera jafari*, *Syracosphaera pulchra*, *Calciosolenia murrayi*

Nannoplankton association of the NN9 zone (*Discoaster hamatus*):

*Discoaster hamatus*, *Calcidiscus leptoporus*, *Calcidiscus premacintyreii*, *Sphenolithus abies*, *Sphenolithus moriformis*, *Reticulofenestra pseudoumbilicus*, *Reticulofenestra* aff. *productella*, *Rhabdosphaera sicca*, *Pontosphaera multipora*, *Braarudosphaera bigelowii* (small forms), *Helicosphaera carteri*, *Helicosphaera intermedia*, *Helicosphaera* cf. *orientalis*, *Scyphosphaera lagena*, *Umbilicosphaera rotula*, *Umbilicosphaera jafari*, *Syracosphaera pulchra*, *Calciosolenia murrayi*

## References

- ANDREYEVA-GRIGOROVIC, A. & HALASOVA, E., 2000: Calcareous Nannofossils biostratigraphy of the Early Miocene sediments of the Vienna Basin NE part (Slovakia). - Slovak Geol. Mag., 6, 2-3, 101-105, Bratislava.
- BERGGREN, W.A., KENT, D.V., SWISHER, C.C. & AUBRY, M.-P., 1995: A revised Cenozoic Geochronology and Chronostratigraphy. - In: BERGGREN, W.A., KENT, D.V. & HARDENBOL, J., (eds.): Geochronology, Time Scales and Global Stratigraphic Correlations: A Unified Temporal Framework for a Historical Geology. - SEPM Special. Publ., 54, 129-212, Tulsa.
- FORNACIARI, E., DI STEFANO, A., RIO D. & NEGRI, A., 1996: Middle Miocene quantitative calcareous nannofossil biostratigraphy in the Mediterranean region. - Micropaleontology, 42/1, 37-63, New York.

- HUDÁČKOVÁ, N., 1995: Ecotype variability of genus *Ammonia* BRUNNICH 1772 in Neogene of paratethys and their paleoecological significance. - *Mineralia Slov.*, 27, 133-144, Bratislava.
- HUDÁČKOVÁ, N., 1995: Dinoflagellata from the Pannonian sediments of the NW part of Vienna basin. – *Rom. Journ. Stratigr.*, 76/7, Bucharest.
- HUDÁČKOVÁ, N. & SLAMKOVA, M., 2000: Paleoecological reconstruction of the Pannonian sediments of the NW part of the Vienna Basin (Slovak part). - *Mineralia Slov.*, 32, 439-441, Bratislava.
- KOVÁČ, M., HUDÁČKOVÁ, N. & BARÁTH, I. 2000: Paleogeography, Geodynamics & Eustacy in the Carpathian – Pannonian region during the Miocene. - *EEDEN, Environments and Ecosystem Dynamics of the Eurasian Neogene*, 29-38, Lyon.
- MARTINI, E., 1971: Standard Tertiary and Quaternary calcareous nannoplankton zonation. - In: *Proceeding of 2nd planktonic conference 1970*, 739-785, Roma.
- SABOL, M., 2000: Neogene Carnivores of Slovakia. - *Slovak Geol. Mag.*, 6/2-3, 124-126, Bratislava.

## **The position of the Pontian relative to Mediterranean Stages**

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Accurate datings of the lower and upper limits of the Pontian stage are of crucial importance for palaeogeographical and palaeoenvironmental reconstructions pertaining to the latest Miocene to Early Pliocene High Resolution Interval 1 (~ 7 - 4 Ma) of the EEDEN Programme. New magnetostratigraphic as well as calcareous nannoplankton data inferred from the upper Maeotian to Dacian records of the Dacic Basin in Romania allow high-resolution correlations with Tortonian, Messinian and Lower Pliocene successions of the Mediterranean. The results demonstrate that the Maeotian – Pontian boundary should be placed at ~ 6.15 Myr, while the Pontian – Dacian boundary has an age of about 5.30 Myr (SNEL et al. in prep.). The occurrences of interbeds with marine calcareous nannoplankton assemblages in upper Maeotian and Pontian deposits of the Eastern Paratethys reflect ephemeral marine incursions from the Mediterranean, probably through the Northern Aegean Corridor.

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Jahr/Year: 2001

Band/Volume: [4](#)

Autor(en)/Author(s): Grigorovich Aida

Artikel/Article: [Mid-Miocene nannoplankton correlation in the Paratethys 10-13](#)