

# International Symposium on Foraminifera FORAMS 2014

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Abstract Volume



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assemblages. The results represent the first detailed biostratigraphic zonation based on planktonic foraminifera from the Palmyride area. Nine biozones have been established: 1) *Dicarinella concavata* Zone; 2) *Dicarinella asymetrica* Zone; 3) *Globotruncanita elevata* Zone; 4) *Contusotruncana plummerae* Zone; 5) *Radotruncana calcarata* Zone; 6) *Globotruncanella havanensis* Zone; 7) *Pseudoguembelina palpebra* Zone; 8) *Racemiguembelina fructicosa* Zone and 9) *Abathomphalus mayaroensis* Zone. The biostratigraphic zonation is compared with the standard zonation.

Documenting changes in planktonic foraminiferal assemblages and lithological alterations are critical for paleoclimatic and paleoceanographic interpretations. The late Turronian to early Campanian foraminiferal assemblages (biozones I-III) suggest tropical to subtropical climate and deposition in outer shelf environments. The well-preserved and highly diversified late Campanian to early Maastrichtian foraminiferal assemblages (biozones IV-IX) imply a well-stratified water column while the lithological characteristics of the deposits indicate outer shelf to upper bathyal environments. A decrease in the number of planktonic species during the late Maastrichtian indicates cooling and deterioration of paleoceanographic conditions. Phosphate grains are present in the Soukhne Formation (Santonian–Lower Campanian) and are an important indicator of specific geological and paleoenvironmental conditions, such as oxygen deficiency, upwelling and transgression. The results of this detailed stratigraphic analysis, including biostratigraphy and lithostratigraphy, provided insights into the nature of deposition along the northern passive margin of Gondwana during the Cretaceous, and the determinations of the composition and diversity of foraminiferal assemblages allowed important new paleoecological and paleoclimatic interpretations.

### **Middle Miocene benthic foraminiferal communities and their response to shallowing-upward trends – example from Croatia**

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During the Middle Miocene, Northern Croatian Medvednica Mt. was an island within the Pannonian Basin, situated at SW margin of the Central Paratethys Sea. Miocene sedimentary rocks (Upper Badenian *Bulimina – Bolivina* zone), from the SW slopes of Medvednica Mt. clearly reflect a transgressive-regressive cycle with emersion during the late Middle Miocene (Badenian/Sarmatian boundary in local Paratethys stratigraphy; equivalent of Middle Serravalian Mediterranean substage).

Shallow marine sediments of the Upper Badenian *Ammonia beccarii* ecozone were transgressively deposited over the Mesozoic carbonate basement. Marginal marine, extremely stressed, highly oxygenated environment of normal salinity (lower part of the Borovnjak section) is represented with *Elphidium–Asterigerinata–Ammonia* community, with low diversity and strong domination. Locality Gornje Vrapče reflects a contemporary restricted marine inner shelf environment (lagoon or deep bay). After the initial transgression, stable conditions were established with highly diverse *Elphidium–Asterigerinata* community, typical for environment with sufficient oxygen content and diverse food supply.

Regression in the upper part of studied sections is in concordance with global sea-level fall. In marginal shoal area (Borovnjak locality) variations in salinity appear, finishing with brackish conditions. Biota is defined as *Ammonia–Elphidium* community. Deeper and more sheltered environment of Gornje Vrapče reflects regressive trends in cyclic lamination. Laminae differ in colour, calcium content and foraminiferal communities (*Heterolepa–Bolivina* community / *Bolivina–Cassidulina* community / *Elphidium–Asterigerinata* community). The uppermost part of the section is represented with corallgal biolite, and, finally, emersion between the Upper Badenian and Lower Sarmatian deposits. Dominant controlling factors of foraminiferal communities in laminated part of section were fluctuations in bottom

oxygen content (BFOI 54.75–93.94), and changes in quantity and quality of food supply. Possible causes can be significant periodical input of terrestrial material and/or seasonal oxygen depletion at sea bottom.

### Assessing modern foraminiferal distribution as a tsunami indicator for coastlines facing the Japan Trench

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Along the northern segment of the Japan Trench, the subduction of the Pacific plate under the Eurasia plate has frequently generated tsunamigenic-earthquakes up to ~M 8.0. In contrast, the middle and southern segments of the Japan Trench were considered relatively inactive until the 2011 Tohoku-oki event generated a M 9.0 multisegment earthquake and one of the largest tsunamis in recorded history. Geologic evidence on the Sendai plain revealed an event in A.D. 869 that could have forecast the severity of the Tohoku-oki tsunami in 2011. Seismic models indicate that the Tohoku-oki earthquake may have transferred stress southwards down the fault causing an anomalous increase in stress along the potentially locked southern segment of the Japan Trench. This scenario could produce an earthquake in the near future that would be comparable in magnitude to the Tohoku-oki event. Reconstructing the history of individual great earthquakes and accompanying tsunamis over many earthquake cycles provides the full assessment of the seismic hazard.

We collected modern surface samples along two transects located in the Kujikuri Beaches region (eastern Japan) and documented the foraminiferal distributions along the coastal zone. Foraminiferal analysis discriminated among subtidal, foreshore, backshore and dune environments. Highest standing crops of foraminifera were found in subtidal samples and markedly decreased landward. Subtidal and foreshore living and dead assemblages were dominated by *Pararotalia nipponica*, *Quinqueloculina* sp. and planktics. Dead assemblages from the backshore and dune areas contained species with robust tests that favor preservation (e.g., *Pararotalia nipponica*, *Ammonia parkinsoniana* and *Lenticulina* sp.). Taphonomic analysis indicated that subtidal and foreshore samples contained higher abundances of unaltered and fragmented foraminifera. The majority of foraminifera in backshore and dune samples were corroded, indicating subaerial exposure. The foraminiferal assemblages and their taphonomic characteristics can be used to reconstruct the paleoenvironment of the Kujikuri Beaches region. We have found two anomalous sand beds (~2-3 km inland) preserved in low-energy environments where they would not normally occur (i.e. rice paddies), indicating deposition by a tsunami.

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## International Symposium on Foraminifera, FORAMS 2014

The International Symposium on Foraminifera, FORAMS 2014, continues the tradition of the highly successful meetings previously held in Halifax (Benthos '75), Pau (Benthos '81), Geneva (Benthos '86), Sendai (Benthos '90), Berkeley (Forams '94), Monterrey (Forams '98), Perth (Forams 2002), Natal (Forams, 2006) and Bonn (Forams 2010). It was in Bonn that the General Assembly decided to hold the 2014 meeting in Concepcion, Chile.

FORAMS 2014 covers all aspects of foraminiferal biology, biostratigraphy, biogeography, ecology and paleoecology, paleoceanography, molecular evolution and systematics, and paleoclimatology. The program includes keynote lectures delivered by renowned scientists in each topic. Altogether, about 85 oral and 70 poster contributions will be presented by over 100 participants from more than 30 countries.

On behalf of the University of Concepcion and the University of Magallanes, we are pleased to bid you a warm welcome to the International Symposium on Foraminifera, FORAMS 2014 in Chile.

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