REPORT ON 2011 IGCP ACTIVITIES IN SLOVENIA

0. SUMMARY OF RESEARCH IN THE IGCP PROJECTS

Research in 2011 involved participation in 7 active projects: the IGCP projects no. 543, 555, 567, 571, 572, 575, 598 and the IUGS/IAGC Geochemical Baselines Project. Besides this Slovenian researchers still cooperate in some scientific groups formed in frame of already finished IGCP projects. Activities consist mainly of field and laboratory work, scientific meetings and preparation of papers for publishing.

The Slovenian participation in these projects resulted in 53 published references.

Organisation of International congress »Paleocene and Eocene, Climate and Changes in that Time« to be organised between Slovenia, Italy, Croatia in 2011 (Dr. Katica Drobne) is as well
part of IGCP activities. In year 2011 the monograph publication »Geology of Slovenia« will be published (edited by Prof. Dr. Bojan Ogorelec).

The Slovene representative attended the European regional IGCP meeting in Caravaca del Cruz in Spain. Poster prepared by Dr. Katica Drobne and Prof. Dr. Simon Pirc on 30 years of participation of Slovene geologists in different IGCP project was presented there.

Within activities in 2010 a preparation and publication of Geology of Slovenia was carried out. The book comprises of the most important results of geological research in Slovenia in past several decades including research within IGCP projects.

1. RESEARCH IN THE FRAME OF IGCP PROJECTS ACTIVE IN 2011

The IGCP Project 543: Low-Temperature Thermochronology was started in Slovenia by Georis team, coordinated by Prof. Dr. Jože Pezdič. During 2011 the team continued investigation inside the IGCP project 543 - Low-Temperature Thermochronology. Their topics of the project are also the studies of low temperature processes which can be defined as geochronological parameters. The team's experiences in the isotopic characteristics and geothermometres can be of use in calibration as well as interpretation of main project goals.

Publications:

The IGCP project No 555, Rapid Environmental/Climatic Change in Cretaceous, has been coordinated in Slovenia by Katica Drobne, Paleontological Institute Ivan Rakovec, Slovenian Academy of Sciences and Arts, Ljubljana. The researchers that have been active in several fields:

- For the congress we, as members of the organizing committee, prepared a possible field trip over the carbonate platform in SW Slovenia and Croatia (Dr. H. Egger, Dr. S. Ćorić), presented on a poster foraminifers, nanoplankton and stable isotopes in the carbonate and flysch developments at the Paleocene/Eocene boundary, co-conducted the post-congress field-trip to Sonnberg, and prepared two papers on the matter (reference).
- At the meeting we gave a talk on taphonomic processes on foraminifer tests as the only unit within this type of research, and submitted a paper for publication.
- For the meeting of international experts specialized for research of Paleocene and Eocene larger foraminifers WOLF at Buzet in September 2011, headed by V. Ćosović, we prepared an overview of conical foraminifers in Paleogene of Tethys, proposed changes in index species at the Paleocene /Eocene, resp. Thanetian /Ilerdian boundary, and presented memorial photos from visits to Slovenia and Croatia by the late Prof.
Lukas Hottinger, external member of the Slovenian Academy of Sciences and Arts (K. Drobné).

- From the past research of recent foraminifers from underwater cliffs of Kornati archipelago (2010) we prepared sediments for selection of tests and determination of foraminifers. Research is still in course.

- For publication of a monography Larger foraminifers on Paleogene Adriatic Platform in the journal Folia botanica et geologica (SAZU 4th class) preparing of voluminous material with illustrations is in course, and will be continued also in 2012.

- Cooperation with colleagues abroad, some of the mal so co-authors in our research, has been necessary, and will have to be maintained also in 2012 with more mutual meetings, and supported by research of the Paleocene / Eocene boundary as well as foraminiferal research in recent seas (systematics, environment, in Adriatic Sea, on submarine shallow rockcliffs).

**Publications:**


**Studies in the IGCP Project No 567, Earthquake Archaeology - Archaeoseismology,** are split in two teams, first led by Nina Župančič, Geology Department, University of Ljubljana and the second by Miloš Bavec, Geological Survey of Slovenia. The work of the first team was focused in the research on Mošnje archaeological site, dealing with provenance of natural stone used as building and decoration stone in archaeological site. For material from pyroclastic material its local provenance was confirmed. On the basis of detailed mineralogical (x-ray diffraction) and petrographical (thin section) characterisation of archaeological and stone material clear distinction between Peračica and Kamna gorica tufts was possible. It seems most probable that majority of Peračica tuff material was quarried in Bogatajve kamnolom. Source of Kamna gorica tuff artefacts was on pebble bars of Sava River. One diploma work was finished in the frame of these topics. All other archaeological stone material (building stones, mortars, mosaics) is made of different sedimentary rocks. It seems that material was not from immediate surroundings and was brought from Emona. From this topic other Bachelor degree will be finished in beginning of 2012. Additional research was done on Neolithic stone artefacts from Monkodonja (Istria), where identified jadeite, diabaze and serpentinite axes confirm established connection and trade of this area with the Italy, Croatia and Austria. Results will be presented on Asmosia conference in Rome in 2012. Aerial survey (LIDAR) was made over some archaeological sites in NE Slovenia for possible effects of seismic activity. Stone material from Orehova vas and Hotinje was documented. Data is still processed.

The research of the second team was focused in the paleoseismological study that was executed on the Libna Hill, Krško Basin including excavation, logging and interpretation of three paleoseismological trenches. The main trench was excavated within an archeologically protected area of iron-age (Hallstadt). Therefore an extensive archeological study accompanied classical paleoseismological work. Three iron-age houses were excavated and settlement was dated to 500 - 800 years b.c. by archeological findings. Archeological survey also revealed that all seismic deformation on Libna pre-dates the iron age. Preparatory work (geomorphology, geophysics) was done in Ljubljana Basin for paleoseismological trenching
to be conducted in 2012. Results of current status of paleoseismological research in the Ljubljana Basin were presented at several occasions including conferences in Vienna (EGU) and Corinth (IGCP 567).

Publications:


HORVAT, Jana, ZUPANČiČ, Nina. Raziskave amfor s Sermina. Argo, 2010, 53, 1, str. 82-83. [COBISS.SI-ID 31727149]


The IGCP Project No 572, Radon, health and natural hazards is led by Prof. Dr. Tadej Dolenec, Geology Department, University of Ljubljana.

In the year 2011 radon research focused on study of geophysical processes of radon transport in karst caves and in soil gas and research of nano aerosols (10–1000 nm) in air to which short lived decay products (RnDP) attached. In karst caves (Postojna and Kostanjevica) and surrounding outdoor air long-term continuous measurements of radon and hidrometeological parameters are analysed. It was established that changes between outside and cave air temperature is crucial in controlling radon levels in cave. The delay between outside temperature and radon concentration change is approximately 3 to 4 days. The results were presented in two congresses and published in an international journal. Measurements of radon and radon carrier carbon dioxide transport has been studied in soil gas at different geological bedrock in Slovenia and Japan. Part of the results of these studies were published in an international journal. In karst cave and in a dwelling the research were orientated to indicate the size distribution of radioactive and non-radioactive aerosols in the air. For this purpose, their concentration and size distributions have been measured. In 2011 the course “Radon in buildings: precaution for reducing concentration” were performed in organization of Radon Center, Jožef Stefan Institute (IJS), Slovenian Slovenian National Building and Civil Engineering Institute, Slovenian Radiation Protection Administration and Radon Competence Centre, University of Applied Sciences of Southern Switzerland (SUPSI), Canobbio, Switzerland. At the end of the year the sistematical measurements of radon, thoron and their short lived decay products in 400 homes over the entire Slovenia begun.

Publications:
The IGCP Project No 572: Permian – Triassic ecosystem also split into two groups of which the first is led by Prof. Dr. Tadej Dolenc, Geology Department, University of Ljubljana and the second by dr. Tea Kolar Jurkovšek, Geological Survey of Slovenia. The focus of the first group geochemical analysis by XRF analyzer have been completed in the Permian - Triassic boundary sedimentary sequence in the Idrija Valley. Utilizing the latest technology and portable handheld XRF analyzer was sampled the profile with great precision (interval 3 mm). Through standards and reference measurements in a certified laboratory the results were calibrated and statistically processed. In further research we will also do the same analysis on the near Masore section. The aim of the study is high-resolution geochemical correlation of two sections as well as determination of the stratigraphic an geochemical P-T boundary.

The focus of the second group was in continuation of biostratigraphic study in the sections of the Permian-Triassic interval in Slovenia a) Lukač section: conducted analyses of microfauna (conodonts, foraminifers) that are published in three papers. Based on Hindeodus-Isarcicella population and Hadrodontina genus it was possible to establish seven conodont biozones, revision of certain foraminifera genera was done and four new species of foraminifera were described. Lukač section is up to now the only locality in entire region of Dinarides where the Permian-Triassic boundary is defined according to international criteria; b) Vojsko and Bende sections: continuation of laboratory preparation of micropaleontological samples and first step...
of their analyses, and c) Studorski preval section: additional field work with sampling, first step of sample preparation. Outside Slovenia, in the region of Dinarides we also conducted comparative studies in Bosnia and Herzegovina and in Romania. Major part of micropaleontological preparation was done in laboratory facilities of cooperating partners (Sarajevo, Bucharest). Expected results will be based on definition of micropaleontological content, predominantly conodonts as most accurate biomarkers. In 2011 some results of comparative study (lithofacies, microfauna) of the sections at the Croatia-Bosnian boundary were published. We defined Lower Triassic lithotypes and included microfauna in the studied sections (conodont biozones isarcica and obliqua).

**Publications:**


The IGCP Project No 575: Pennsylvanian terrestrial habitats and biotas of southeastern Euramerica is led by dr. Tea Kolar Jurkovšek, Geological Survey of Slovenia. At the occasion of the project meeting in Zagreb (5.-8. September 2011) the team participated at the “Zagreb workshop – IGCP 575 meeting” with topic on late Paleozoic terrestrial habitats and biota where significance of archive and museal paleobotanic collections in Europe was emphasised. There was a presentation of all known late Carboniferous flora in Slovenia. The first documents date back in the nineteenth century. Fossil flora in Slovenia is confined to two geotectonic units, namely Westphalian strata Sava Faults and Stephanian strata of Karavanke Mts. Paleozoic flora is significant for stratigraphy of Slovenia and it supplements knowledge of Euroamerican flora.

Publications:

Studies in the IGCP Project No. 598 Environmental Change and Sustainability in Karst Systems, are led in Slovenia by Martin Knez, Karst Research Institute, Scientific Research Center of the Slovenian Academy of Sciences and Arts, Postojna, Slovenia. The year 2011 was the starting year of this project.
Basic guidelines of the project IGCP 598, which co-leader is for the first time also researcher of IZRK ZRC SAZU are:
- interdisciplinary basic and applied scientific research to advance better understanding of general karstological lawfulness and how environmental change impacts on karst systems,
- inform and influence on decision making over karst regions,
- sustainability research of karst systems with regard to human activities and ecological protection,
- establish with what amounts the project will be enriched with of non-IGCP funding and informing the society about it,
- to realize outlined goals strong connections and co-operations of academic spheres round the world are needed.
They have taken part in two meetings in USA last year (introduction one of project leader and carbonate geochemistry. V attracted Russian researchers in the project and started with common researches on Altai, and they researched western part of Cuba with Cuban karstologists.

Publications:
The IUGS/IAGC Project, Geochemical baselines, is led in Slovenia by Mateja Gosar, Geological Survey of Slovenia, Ljubljana. In 2011 Mateja Gosar took part at the EuroGeoSurveys Geochemistry Expert Group Meeting. A three-day business meeting of the Expert Group was held in Espoo, Finland, from the 5 to 7 October 2011. The focus of the meeting was on the GEMAS project and the URGE - Urban geochemistry project. Mateja Gosar presented talk with title: GEMAS results for Slovenia« and lecture entitled »Introduction to URGE project«. Research in is focused in different urban environmental media (soil, stream and street sediment, household dust). In 2011 all this media were sampled and analysed. For the next year we are planning to interpret gathered data. Mateja Gosar also took part at the the 25th International Applied Geochemistry Symposium (IAGS 2011, Rovaniemi, Finland) where she presented talk entitled «Environmental impacts of ancient small-scale highly contaminated Hg ore processing site (Idrija area, Slovenia)«.

Publications:

With sincere regards,

Prof. Dr. Nina Zupančič
Secretary of National Committee

Assist. Prof. Dr. Marko Komac
Chairman of National Committee