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Newsletter 246 reports in the student corner session work made by Larrauri and Tsegab Gebretsadik thanks to IAS student grant.

In the centre of the Newsletter is announced that Canada proposed to organize on 2018 the 20th International Sedimentological Congress in Quebec City.

The call for nomination for:1) **Sorby Medal**, the highest award of2) **Johannes Walther Award** for mid career geologists, and 3) **The Young Scientist Award**, is open. Please send your nomination(s) by e-mail to pascucci@uniss.it

I would like to remember that the next IAS Regional Meeting will be held in 2013 in Manchester (UK) for details, please check: www.sedimentologists.org/ims-2013.

Electronic Newsletter (ENIAS) started in November 2011continues to bring short information to members. For info on ENIAS contact Nina Smeyers at nina.smeyers@ugent.be.

Check the new Announcements and Calendar remembering that Meetings and events in **CAPITAL** and/or with * are fully or partially sponsored by IAS. For all these meetings, IAS Student Members travel grants are available. Students can apply through the IAS web site remembering, however, that to receive the travel grant potential candidates have to present the abstract of the sedimentological research they will present at the attending conference. More info@

www.sedimentologists.org

Vincenzo Pascucci
(IAS General Secretary)

CALL FOR NOMINATION

During the next International Sedimentological Conference, Geneva 18-25 August 2014 three scientists will be awarded respectively with:

1) **Sorby Medal**, the highest award of the International Association of Sedimentologists, addressed to people «distinct in Sedimentology»

Previous Sorby medallist are:

- 1978 R.A. Bagnold, F.P. Shepard (Sedimentology 26, 157-165)
- 1982 F.J. Pettijohn (Sedimentology 30, 149-151)
- 1986 R.G.C. Bathurst (Sedimentology 34, 177-186)
- 1990 R.L. Folk (Sedimentology 38, 191-195)
- 1994 J.R.L. Allen (Sedimentology 42, 191-192)
- 1998 R.N. Ginsburg (Sedimentology 46, 201-203)
- 2002 R. Walker (Sedimentology 50, 113-118)
- 2006 C. Schreiber (Sedimentology 54, 1449-1452)
- 2010 J. Bridge (IAS Newsletter, 232, 5-7)

2) **Johannes Walther Award** for mid career geologists;

Previous Award was

- 2012 G. Eberli (IAS Newsletter, 243, 6-9)

3) **The Young Scientist Award**

Previous Award was

- 2012 S. Andreucci (IAS Newsletter, 243, 10-12)

STUDENT CORNER

Sedimentological and Geochemical Analyses of the Upper Paleozoic Sedimentary Sequence in Kinta Valley, Peninsular Malaysia

IAS GRANT 2ND SESSION 2011

INTRODUCTION

The Pre-Tertiary succession of Peninsular Malaysia includes a thick Palaeozoic sequences. Most of the outcropping Paleozoic strata include limestones, interbedded sandstone, schist, siltstone, and quartzite.

The carbonate strata are subjected to different types of alterations including contact metamorphism. The low grade metamorphism has turned the rock into marble and has obliterated some of the original sedimentary structures and most of the rock components. However, few exceptions are present, such as the limestone outcrops exposed at Sungai Siput, and Chemor, in the northern

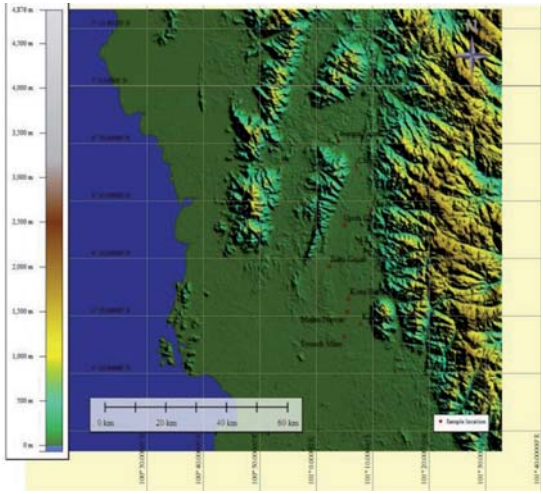

Figure 1.- Sampling location of the study area.

Figure 2.- Black limestone with chert layers.

part of the Kinta Valley where it is possible to see some sedimentary features and identify components of the limestone. In this study, an attempt is made to characterize the outcrops of Kinta Valley in relation to their chemical and sedimentological signatures.

Figure 3.- Rarely common fossiliferous limestone.

Figure 4.- Highly metamorphosed course grained marble.

Preliminary results presented here provide clues to establish a reference lithostratigraphic, and chemostratigraphic section of the Palaeozoic carbonate and underlying clastic sequences. These will contribute to the ongoing research on Paleozoic basin study of the Peninsula.

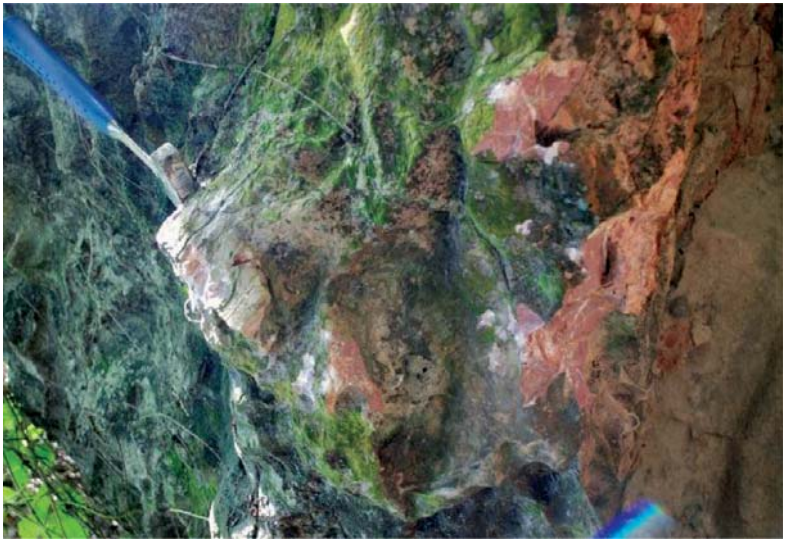

Figure 5.- Reddish limestone unit from Kampar.

GEOLOGICAL AND STRATIGRAPHIC SETTING

The Peninsular can be subdivided into three belts with different stratigraphic sequences and tectonostratigraphic origins. These are Western Belt (including the North-West Domain), Central Belt and Eastern Belt. The Western Belt includes Malacca, most part of Negeri Sembilan, Selangor, Perak, Kedah, and Langkawi. The Kinta valley is located in the northern part of the Perak state entirely within the Western Belt.

The stratigraphic taxonomy of the Peninsular lithologies includes about forty-two formations. Lower Paleozoic rocks are found in the western part of Peninsular, whereas Upper Paleozoic sequences are found in all the three belts. The Paleozoic rocks of the Western Belt are common along the foothill sides of the Main Range. On the western side of the Main Range is the Baling Group sediments consisting of the Papulut quartzite, Grik Siltstone, Lawin Tuff and Bendang Riang Formation in north Perak of probable Cambrian to Permian age. Further south in the Western Belt are the Silurian to Permian age Kinta Limestone, Terolak Formation and Kati Formation in Perak. The Kinta valley limestones have been assigned variable ages in different outcrop locations resulting in tentative geological time boundaries. A few workers focused on the geology of the Kinta Valley and their work is summarized in Ingham and Bradford including the controversies on the dating and stratigraphic succession. Because of controversies and inconsistencies on the sequences and dating of the Kinta valley lithologies, an independent geologist was invited to intervene and published a geological succession as: recent alluvium, High-level alluvium, western boulder clay, intrusion of Mesozoic granite, schist series and Tekka clay (Triassic), and Limestone (Permo-Carboniferous).

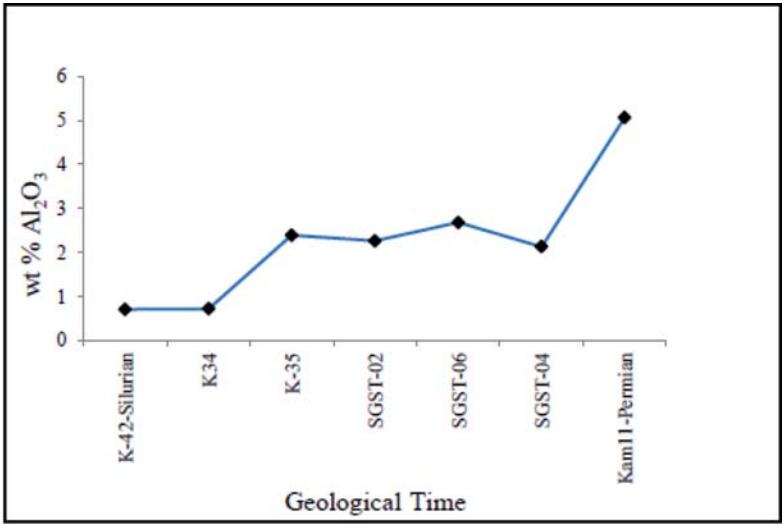

Figure 6.- Aluminum oxide compositional variation of Palaeozoic limestones with time Kam11-Permien.

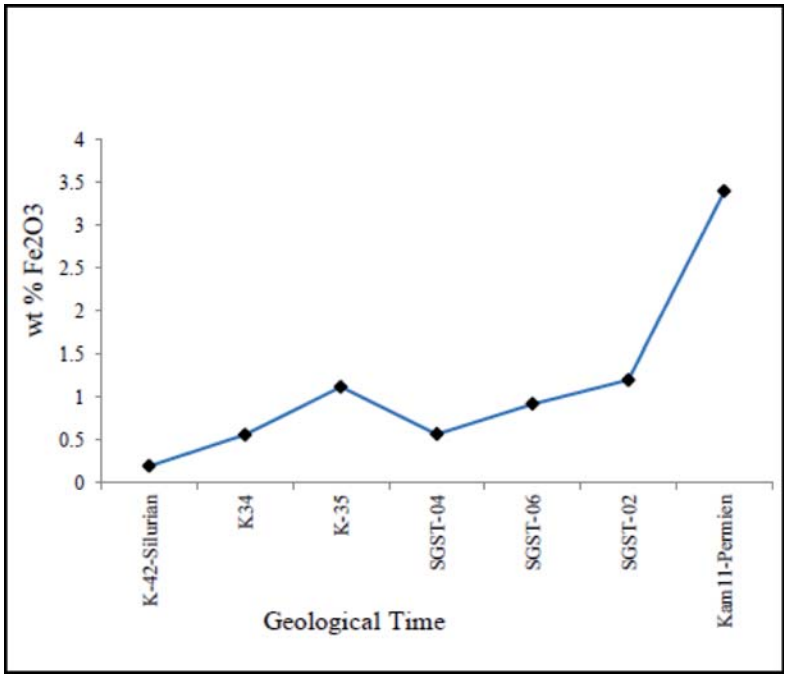

Figure 7.- Ferric oxide compositional variation of Palaeozoic limestones with time.

Ingham and Bradford, who presented a slightly modified geological sequence for the Kinta valley include: Quaternary (alluvium), Intrusion of Mesozoic granite, arenaceous series of Triassic age, Calcareous series of Carboniferous age (limestone with interbedded shale and rare quartzite). They also considered schist to be neither older nor younger but contemporaneous with the Carboniferous sedimentary succession.

Despite the fact that the area received much geological attention for the last hundred years, studies were focused on limited fossil occurrences in the limestone to resolve the stratigraphic discrepancies. The limited fossil assemblages were conodonts, fusulinids, crinoids, rugose corals, bivalves and gastropods. These are probably from re-deposited shallow- marine breccia beds in deep-marine setting and have a negative effect on the reliability of the dating. A single attempt was done by Hutchison (1996) to characterize the limestones of West Malaysia which excluded the Kinta valley limestones. Thus, this work focuses on sedimentological, chemostratigraphic, and petrographic approaches to establish a reference section for the Kinta limestone and associated clastics fig. 1.

METHOD AND MATERIALS

In this study four major activities were carried out. These are: field observation, sample collection, sample

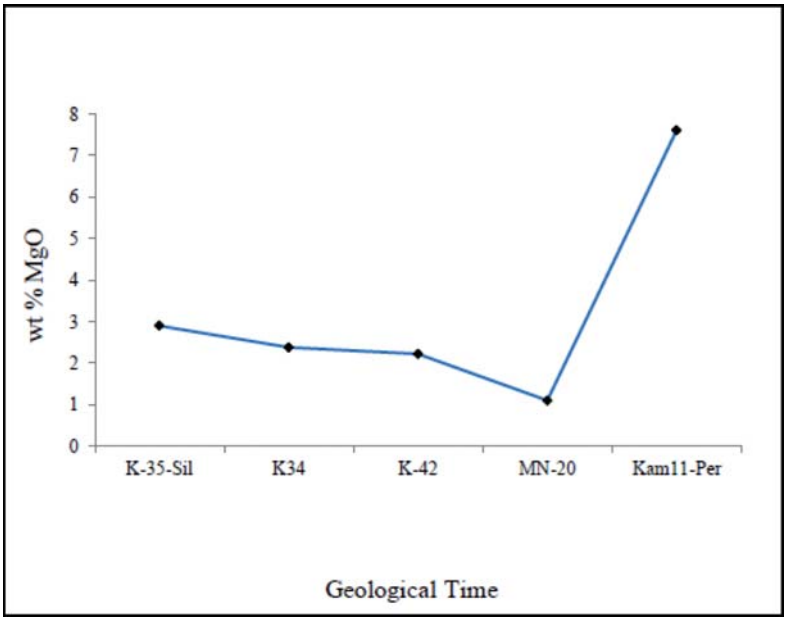

Figure 8.- MgO compositional variation of Palaeozoic limestones. (Sil=Silurian, Per=Permian).

processing in laboratory, and analyses and interpretation. Fieldwork was carried out to do sedimentological description, photographs, and collecting samples for laboratory analyses. Qualitative description of sedimentological features was made on the basis of texture, sedimentary structures, fossil contents, color, and structural elements of the outcropping strata. The samples were used for petrographic, XRD, XRF and SEM analyses. Some portions of the collected samples were processed in Minerals and Geoscience Department of Malaysia (JMG), Perak and Universiti Teknologi PETRONAS (UTP) laboratories. The fieldwork observations, petrographic description and geochemical results are included in this report.

RESULTS AND DISCUSSION

A) Lithological Descriptions

Detailed descriptions of the crystallized limestones with respect to their lithofacies properties were made to see if a systematic characterization was possible to adopt. The carbonate outcrops can be categorized into four lithological categories. These are ranging from less altered dark mudstone, to highly metamorphosed white, and few distinctive reddish coloured, fine grained lithofacies.

A dark-coloured, fine-grained limestone with remarkable syndepositional deformational structures (slumps) was identified. It was found interbedded with possibly organic rich argillaceous material and common at the Lion Hill of Sungai Siput. This unit

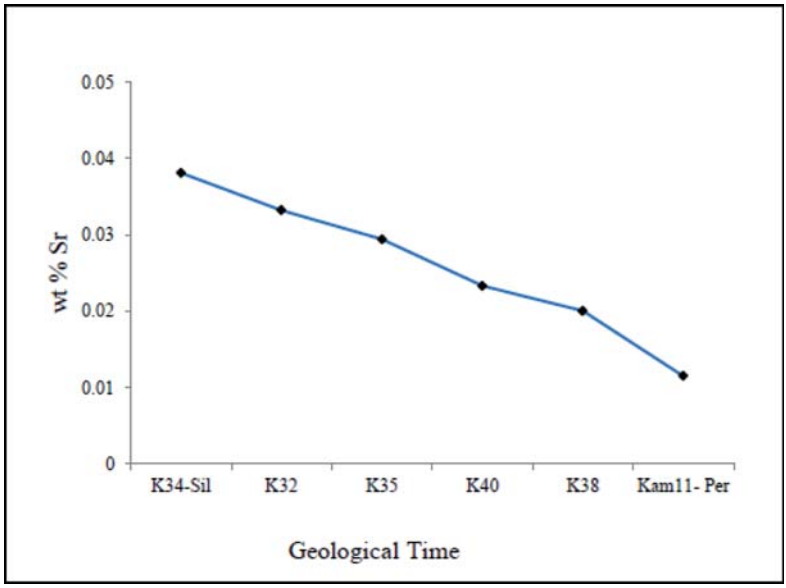

Figure 9.- Compositional variation of Sr with time for the Paleozoic limestone of Kinta Valley.

has thinly bedded chert and forms protruded sharp edged chert units at the surfaces of the outcropping strata as shown in fig. 2. This black, and less altered limestone forms a sharp contact with the underlying siliciclastic succession at Lion Hill. The siliciclastic unit, mainly sandstone, is characterized by three sets of dense fracture networks. It displays a tarnished to reddish colour and is underlain by siltstone and black shale.

Another available lithofacies is dark grey-coloured and medium to coarse-grained calcite crystals as compared to the black unit. It is moderately metamorphosed and forms banding of white and black laminae. This unit is the most dominant type of lithofacies in the area. In rare cases it has been found with macrofossils such as crinoid stem components in Gunung Khantan (fig. 3). It is also characterized by sporadically changing orientation of bedding within short lateral distances. The third common lithofacies is characterized by a high degree of metamorphism and contains cm–size calcite crystals fig. 4. It appears whitish in colour and is found close to the intrusive bodies of the Main Range (e.g., Ulu Kinta; fig. 1). It has a sharp contact with the granitic intrusive and shows ductile deformational features in the overlying marble. Due to its degree of metamorphism all sedimentary structures have been obliterated. In some localities it contains thinly bedded chert layers at the base of the outcrop, for instance, in Kek look Tong.

The fourth lithological unit is different in color than the rest of the facies. It is reddish in color and occurs only in the southern end of the study area. The only location where this facies is encountered is in one of the former

Tronoh tin mines west of Kampar. It contains cross-cutting fractures filled with shiny white calcite crystals and is dominated by a fine grained matrix (fig. 5). This unit is characterized by its rare occurrence and by having a relatively higher amount of silica (3.58 wt %). In addition, it also contains Sr and Ti that makes it a bit different from other samples lithologies.

B) Geochemical Analyses

According to the facies classification, which is based on the degree of alteration (metamorphism), colour, and grain size (calcite crystals), samples were selected for geochemical and analytical analyses. The samples are grouped by spatial distribution, geological age and lithology type. The preliminary results of geochemical analyses are plotted in figs. 6-8. Fig. 6 and 7 show the plots of trivalent oxides of Fe and Al. It appears that the older rocks contain less trivalent oxide than the younger rocks of the crystallized limestone. Not only the trivalent oxides are less abundant in the older rocks (Silurian to Devonian) but also show an incremental trend towards the southeast direction which is suggested to be Carboniferous-Permian age in Suntharalingam. The trend of the divalent oxide of Mg is presented in fig. 8. The spatial and temporal trend is generally similar to the trends in the trivalent oxides of Fe and Al except there is an abrupt increase of MgO concentration in the Kampar area which is dated as Carboniferous-Permian age. Thus the compositional variations of the analysed samples show a general decrease of divalent and trivalent oxides of Mg, Fe and Al concentration with increasing time.

Another encouraging result of the geochemical analyses is the presence of Sr and its oxide in some of the analysed carbonate samples. This makes it more interesting since Sr is assumed to be resistive to diagenetic and metamorphic alterations. The concentration of Sr is higher in the older limestones than younger limestone samples (fig. 9). The decreasing trend of the Sr concentration (fig. 9) with geological age in the Kinta valley Paleozoic limestone is significant as compared to the compositional variation of the other elements. It is not also common in all the processed samples but detected in few of the sampling locations, for instance in Gunung Khantan.

It is noted that a few trace elements (Mn, Cr, Ti, and Zn) are found in the analysed samples. This may indicate that the crystallized limestones were subjected to invasion by minor elements which are not common in carbonates.

The elemental and oxide concentration plots of the samples taken from Khantan, Silurian according to Wong (1991) and Kampar (Permian) to Suntharalingam (1968), show similar compositional trends except that they have a slight difference in calcium and silica content. The general wiggling trend of the plot reflects the compositional variation of the Khantan samples, which is lower than that of the Kampar samples. The samples, SGST-02, SGST-04, and SGST-06 analysed from clastics underlying the Sungai Siput black limestone, are characterized by smaller compositional variations (figs 6 and 7).

C) Petrographic Analyses

Petrographic study of thin sections shed light on the detailed mineralogy, grain types and depositional environment of the limestones. It enhances the understanding of the diagenetic and metamorphic alterations. The limestone is proved to be greatly affected by recrystallization and

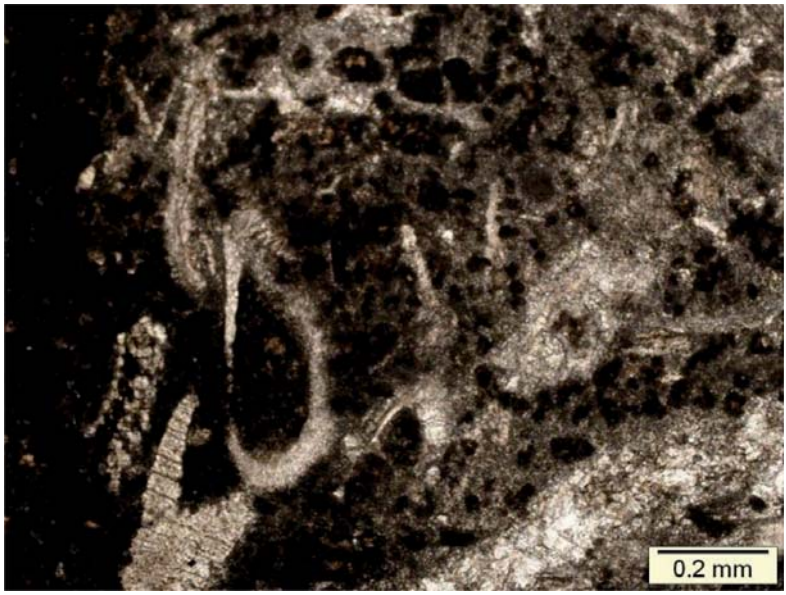

Figure 10.- Fossiliferous unit of the Kinta Valley limestone.

subjected to diagenetic alteration (fig. 10). It is noted that there are late precipitated calcite cements since we have noted some sealed micro-fractures in the thin sections of the palaeozoic limestones of the Kampar area and around Sungai Siput. In addition to this, fossils of crinoids, brachiopods and gastropods are still recognizable under standard microscope and found in breccia beds of Gunung Khantan (fig. 10). Therefore further study was crucial to reveal the fossil records of the samples. For this purpose eight samples were analysed using SEM to look at the detail morphological characterization of microfossils and investigate diagenetic cycles. Fig. 11 shows microfossil at a magnification of 5000 times and it is characterized by having similar morphology to fragments of a conodont. Since conodonts are known for their presence in almost every marine sedimentary rocks it can be used to constrain the chemostratigraphic and lithostratigraphic sections.

DISCUSSION

The field work was carried out in areas exposed to different types of alterations (e.g., metamorphism, and diagenesis). It is dominantly affected by contact metamorphism and karst development. Primary sedimentary features of bedding and syndepositional structures are still preserved. These help interpretation of palaeo-slope orientation and determine the way upward of the sedimentary sequence. The reported fossiliferous sites in the study area are found to be either buried for developmental activities or locked with water bodies. Despite the fact that most of the former tin mines are located below the current water table of the area (and are now flooded), there are still accessible bed rocks exposed in the area of Kampar, Malim Nawar, Kota

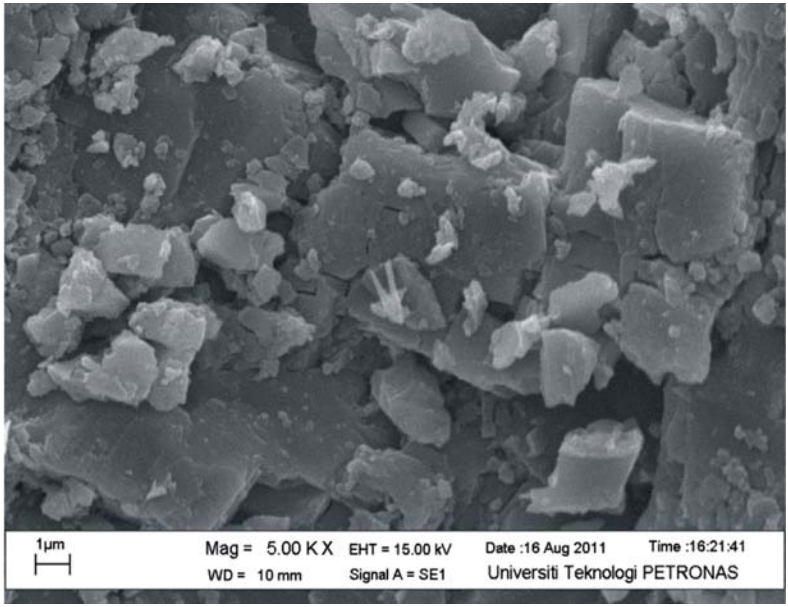

Figure 11.- Microfossil under scanning electron microscope.

Baharu and around Batu Gajah for further observation and description.

Although, a field classification for the lithofacies is suggested based on degree of metamorphism, colour, grain size (calcite) at outcrop scale; it is noted in the petrographic analyses the sedimentary elements of the successions are not enough to reveal the sedimentary features of the Kinta Valley limestone outcrops. Hence geochemical analysis is used as a tool to characterize the outcrops of the area.

Therefore, the geochemical characterization of the outcrops is good enough to identify temporal and spatial variation of elemental and oxide concentrations. A general trend of the chemical variation is decreasing with increasing time except that for Sr it is increasing with time. As the residence time for Sr is 4-3 Ma its variation in concentration might be linked to the paleo-sea composition and could contribute to establish an isotope stratigraphy.

The possible reason for the reddish coloured «limestone» in Kampar might be interpreted as a result of infiltration of ferric oxides due to tropical climate. This is indicated by relatively higher Fe (2.37 wt %) content from the compositional analyses of the samples compared to samples from other locations. Whereas the colour of the other lithological units described could be taken as indicative to compositional reflection and probably related to palaeodepositional environment conditions.

Moreover, no other geochemical analysis has been attempted in order to characterize the Palaeozoic limestones in relation to their temporal and spatial distribution. Therefore, this research can be taken as the first of its kind to apply

sedimentological study intergraded with geochemical, paleontological and analytical approaches for the outcrops.

CONCLUSIONS AND FUTURE DIRECTIONS

Geochemical analyses of a few selected samples have shown promising results in the establishment of a chemostratigraphic framework for the Kinta Valley limestones. The presence of Sr is an encouraging outcome for the application of isotope stratigraphy. Generally the concentration of rare earth elements is in favour to do trace element study of the palaeozoic successions in order to characterize and possibly ascertain the earlier dating of these outcrops.

ACKNOWLEDGMENTS

I am grateful to the financial support from the International Association of Sedimentologists' postgraduate grant scheme for 2011, 2nd session which covers crucial part of my field work expenses. I would like to extend my appreciation to Prof. Dr. Bernard J. Pierson, Shell Chair in Petroleum Geosciences and Head of the South-East Asia Carbonate Research Laboratory (SEACARL), Universiti Teknologi PETRONAS, Dr Aaron Hunter, and Ap. Dr. Chow Weng Sum for their valuable comments in the study and Mr.Abd. Hakim Mohd Yossuf for his help during the challenging fieldworks.

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20th INTERNATIONAL SEDIMENTOLOGICAL CONFERENCE - 2018 QUEBEC CITY (CANADA)

STUDENT CORNER

Study of the δ^{13}Corg of an Early Aptian section in the Basque Cantabrian Basin (Spain) to solve the geochemical problems caused by diagenetic processes

IAS POSTGRADUATE GRANT SCHEME 2ND SESSION 2012

Introduction

The main subject of my PhD is the characterization of the Aptian in the central area of the Basque Cantabrian Basin (South of Bilbao city, North of Spain; Fig.1). Recently, there have been several studies regarding this period in the East (Millán *et al.*, 2009; Millán *et al.*, 2011) and West (Najarro *et al.*, 2011) areas, but the central area have remained somewhat untouched for several years.

One of the main characteristics of this basin is the expanded sedimentary record with a thickness for the Aptian over 1100m. This may allow me to define geological events with greater resolution than the one obtained in other basins (Föllmi, 2012) and find new ones, which might have a more local origin.

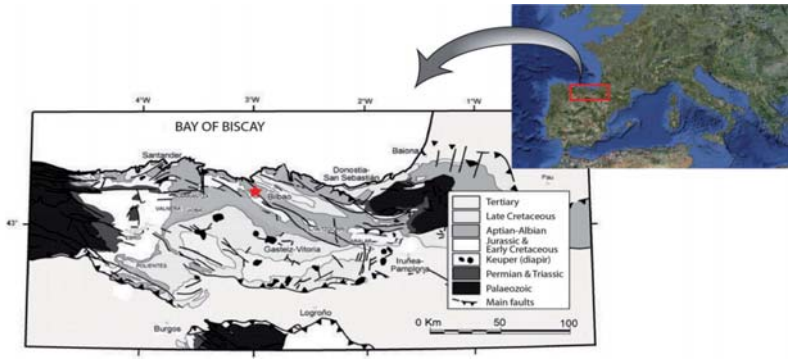

Figure 1.- Location of studied area

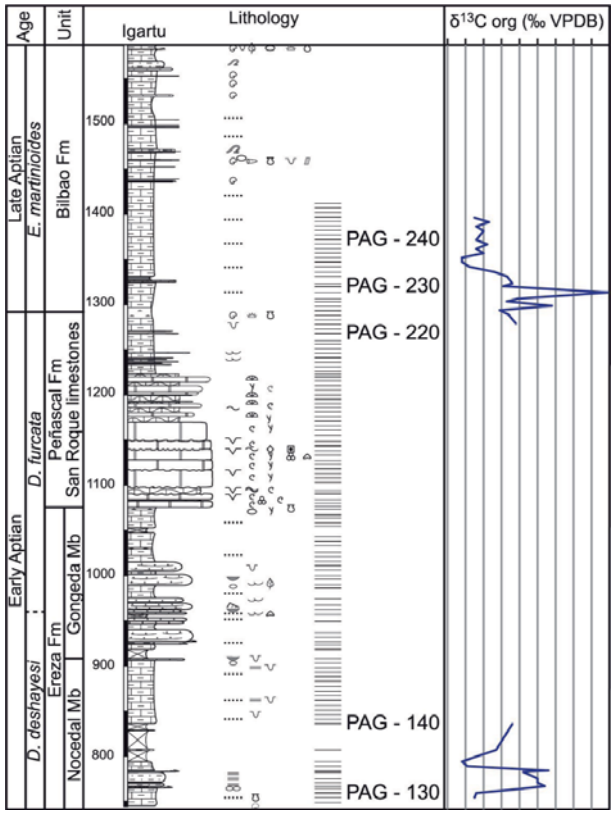

Figure 2.- ig.2: Selected intervals from the Pagasarri section.

The main objectives I intended to achieve at the beginning of this PhD were:

- Sedimentologic characterization of the materials.
- Datation through biostratigraphy (ammonites and orbitolinids).
- Geochemical characterization of the materials (the d^{13}Cinorg, d^{18}O and TOC) to identify global events such as OAE1a.
- Paleoenviromental reconstruction.

So far, two complete stratigraphic sections have been studied (Pagasarri and Ganekogorta) in two key locations within the area and up to 12 minor sections to further complete the obtained data. All the materials have been accurately dated, thanks to the ammonites biostratigraphy studied by prof. Hugh Owen. Over 600 samples have been analysed (δ13Cinorg and δ18O and TOC) and the results studied to compare them with the obtained in other basins, such as the Vocontian basin (Fernández---Mendiola *et al.*, 2012; Herrle *et al.*, 2010).

However, some of the results obtained from the δ13Cinorg have negatives values and, therefore are not reliable. This can be attributed to post---depositional alteration of the isotopic

composition of the rock due to geological processes (either the burial depth of the sediments of materials or the tectonic processes occurred in the Basque---Cantabrian Basin during the opening of the Golf the Bay of Biscay). The analysis of the δ^{13}Corg is a way of recovering the original isotopic signal of the Aptian marine water and, therefore, it can be very helpful to correctly define the paleoclimatic events taking place in this area during this period.

Methods

Three groups of this altered samples correspond to intervals that are of the uttermost importance for the correctly characterization of the Aptian in the area, such as the OAE1a and the Early/Late Aptian transition. I have analysed 48 samples from this three intervals:

- 16 samples from Ganekogorta section: OAE 1a
- 22 samples from the upper part of the Pagasarri section: Early/Late Aptian transition.
- 8 samples from the lower part of the Pagasarri section: OAE1a.

These samples had already been obtained during two field trips, which were conducted during the summer of 2010 (Pagasarri section) and the spring--summer of 2012 (Ganekogorta section). The analysis of the δ^{13}Corg requires of previous decarbonation of the samples, which has been conducted in the laboratories of my own department (Stratigraphy and Palaeontology, Science and Technology Faculty, Basque Cantabrian University) by myself in order to reduce the final expenses. Afterwards, the samples have been sent to the laboratories of a Coruña, where the δ^{13}Corg has been analyzed.

Expenses

The material to prepare the samples have been provided by the laboratory of the Stratigraphy and Paleontology department The Immunology, Microbiology and Parasitology department has also lent me their centrifuge that I need for one of the steps in the decarbonation process. The University of the Basque Country has paid for the expenses derived from the shipment of the samples.

Therefore, all the expenses correspond to the δ13Corg analyses of the 48 samples (20,5€/sample) conducted at the laboratories at the a Coruña University, which add up to 984€ (IVA included).

Results

The δ13Corg results received form the a Coruña laboratories are promising. They have already been plotted into graphics (Fig.2 and 3) and although, further study is needed to locate established events (Ej.: OAE1a, (Menegatti **et al.**, 1998)), it seem to be consistent with previous sedimentologic and isotopic results from these sections.

There doesn't seem to be any traces of diagenetic alteration of the δ13Corg values. Therefore, this isotopic signal will be used in these intervals instead of the one obtained from the δ13Cinorg values. Thanks to that, the OAE1a and the Early/Late Aptian transition in this area will be better characterized in future

Future works

The results will be published in two articles. The first one comprehends the sedimentology, biostratigraphy and chemostratigraphy of the Pagasarri section and is due to be sent to Cretaceous Research in the following weeks. The second one will address a similar topic with the data from the Ganekogorta section. Both of these articles will be a central piece of work in my PhD Thesis.

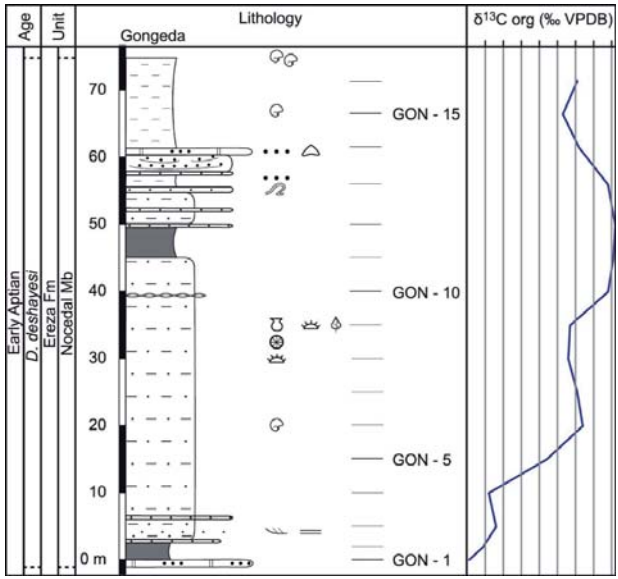

Figure 3.- Selected interval from the Ganekogorta section.

It is also likely that a poster from the Pagasarri section with the isotopic curves will be presented to the 30th IAS meeting in Manchester, although nothing has been yet decided.

Acknowledgements

Firstly, I want to thank the International Association of Sedimentology for awarding me with this grant that has allowed to me to solve crucial problems in the my investigation. Secondly, I want to thank the staff at a Coruña laboratories for their help with the organization of the samples and the promptness in sending the results. Finally, I want to thank my own department (Stratigraphy and Paleontology) and the Immunology, Microbiology and Parasitology department at the University of the Basque Country for the material to prepare sample.

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Special IAS Grants or 'Institutional IAS Grants'

Special IAS Grants or Institutional IAS Grants are meant for capacity building in 3rd world countries. There exists a list of 'Least Developed Countries' (LDC) by the UN. This list categorizes countries according to income per capita and is yearly updated.

Grants are allocated to allow Geology Departments in LDC to acquire durable sedimentological equipment for teaching and research (like sieves, calcimeters, auger drilling tools, etc.) or tools that can be used by all geology students (like general geology/sedimentology textbooks, IAS Special Publications (SP), memory sticks with back issues of Sedimentology or SP, etc). Therefore the grant application should clearly demonstrate to increase the recipient's capacity to teach sedimentology at the undergraduate level (Bachelor) in a durable way. It should also indicate in what way it would enable to support sedimentological research at the graduate level (Master).

Applicants should have a permanent position at their University and should be IAS members. Applications should provide the following information (not exhaustive list):

- the mission statement of the University/Geology Department
- the approval of the University Authorities to accept the grant
- a list of permanent teaching and technical staff members of the Geology Department (with indication of their area of research)
- the structure of the geology undergraduate and graduate courses (Bachelor/Master programme with indication of courses and theoretical and practical lecture hours)
- the number of geology students
- the actual facilities for geology/sedimentology students
- a motivation of application
- a budget with justification
- the CV of the applicant, including a sedimentology research plan

The institutional grant scheme consists each year of 2 sessions of 1 grant of 10.000 Euro. Applications run in parallel with the PhD research grant scheme (same deadline for application and recipient notification). The IAS Grant Committee will seek recommendations from relevant National Correspondents and Council Members (eventually including visitation) before advising the IAS Bureau for final decision. Additional funds made available by the recipient's University are considered as a plus.

Items listed in the application will be bought through the Office of the IAS Treasurer and shipped to the successful applicant. By no means will money be transferred to the grant recipient.

IAS STUDENT GRANT APPLICATION GUIDELINES

Application

The application should be concise and informative, and contains the following information (limit your application to 1250 words max.):

- Research proposal (including Introduction, Proposal, Motivation and Methods, Facilities) – max. 750 words
- Bibliography – max. 125 words
- Budget – max. 125 words
- Curriculum Vitae – max. 250 words

Your research proposal must be submitted via the Postgraduate Grant Scheme application form on the IAS website before the application deadline. The form contains additional assistance details for completing the request. Please read carefully all instructions before completing and submitting your application. Prepare your application in 'Word' and use 'Word count' before pasting your application in the appropriate fields.

Recommendation letter (by e-mail) from the PhD supervisor supporting the applicant is mandatory, as well as recommendation letter (by e-mail also) from the Head of Department/ Laboratory of guest institution in case of laboratory visit.

Please make sure to adequately answer all questions.

Deadlines and notifications

Application deadlines:
1st session: March, 31
2nd session: September, 30
Recipient notification:
Before June, 30
Before December, 31

Guidelines for letter from supervisor

The letter from the supervisor should provide an evaluation of the capability of the student to carry out the proposed research, the significance and necessity of the research, and reasonableness of the budget request. The letter must be sent directly to the Treasurer of the IAS by e-mail before the application deadline.

Application Form

Research Proposal (max. 750 words)
Title: .....
Introduction (max. 250 words): .....
Introduce briefly the subject of your PhD and provide relevant background information; summarise previous work by you or others (provide max. 5 relevant references, to be detailed in the 'Bibliography' field). Provide the context for your PhD study in terms of geography, geology, and/or scientific discipline.
Proposal (max. 250 words): ...
Describe clearly your research

proposal and indicate in what way your proposal will contribute to the successful achievement of your PhD. Your application should have a clearly written hypothesis or a well-explained research problem of geologic significance. It should explain why it is important. Simply collecting data without an objective is not considered wise use of resources.

Methods (max. 125 words): .....

Outline the research strategy (methods) that you plan to use to solve the problem in the field and/or in the laboratory. Please include information on data collection, data analyses, and data interpretation. Justify why you need to undertake this research.

Facilities (max. 125 words): .....

Briefly list research and study facilities available to you, such as field and laboratory equipment, computers, library.

Bibliography (max. 125 words)

Provide a list of 5 key publications that are relevant to your proposed research, listed in your 'Introduction'. The list should show that you have done adequate background research on your project and are assured that your methodology is solid and the project has not been done already. Limit your bibliography to the essential references. Each publication should be preceded by a '*'-character (e.g. *Surlyk et al., Sedimentology 42, 323-354, 1995).

Budget (max. 125 words)

Provide a brief summary of the total cost of the research. Clearly indicate the amount (in Euro) being requested. State specifically what the IAS grant funds will be used for. Please list only expenses to be covered by the IAS grant.

The IAS will support field activities (to collect data and samples, etc.) and laboratory activities/analyses. Laboratory activities/analyses that consist of training by performing the activities/analyses yourself will be considered a plus for your application as they will contribute to your formation and to the capacity building of your home institution. In this case, the agreement of the Head of your Guest Department/Laboratory will be solicited by automated e-mail.

Curriculum Vitae (max. 250 words)

Name, postal address, e-mail address, university education (degrees & dates), work experience, awards and scholarships (max. 5, considered to be representative), independent research projects, citations of your abstracts and publications (max. 5, considered to be representative).

Advise of Supervisor and Head of Guest Department/Laboratory

When you apply for a grant, your PhD supervisor will receive an automated e-mail with a request to send the IAS a letter of recommendation by e-mail. You should, however, check with your supervisor everything is carried out the way it should be. It will be considered as a plus for your application if your PhD supervisor is also a member of IAS.

Supervisor's name: .....

Supervisor's e-mail: .....

If you apply for laboratory analyses/activities, please carefully check analysis prices and compare charges of various academic and private laboratories as prices per unit might differ considerably. Please first check whether analyses can be performed within your own University. If your University is not in a position to provide you with the adequate analysis tools, visiting another lab to conduct the analyses yourself strengthens your application considerably as it contributes to your formation and to capacity building of your home University. Please check with the Head

of Department/Laboratory of your guest lab to assure its assistance during your visit. You should fill in his/her name and e-mail address to solicit his/her advise about your visit.

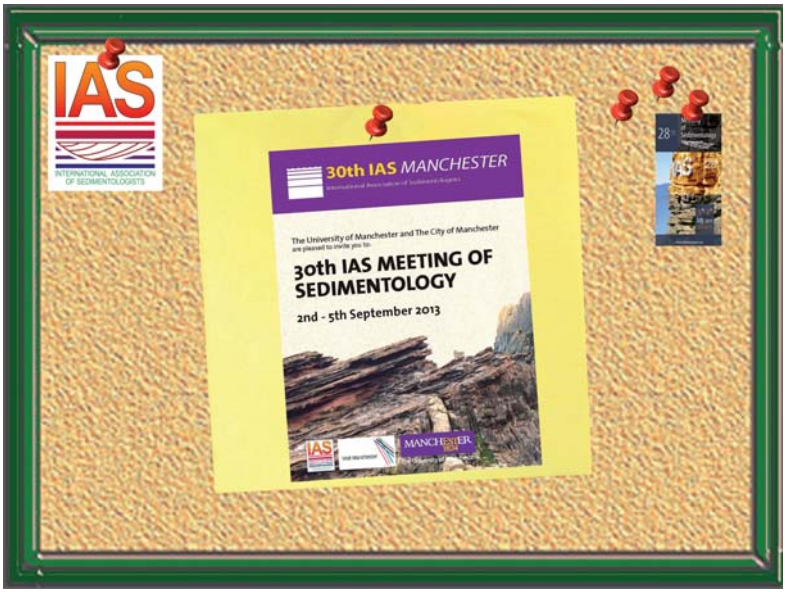
Name of Head of guest Department/Laboratory: .....

E-mail address of Head of Guest Department/Laboratory: .....

Finally, before submitting your application, you will be asked to answer a few informative questions by ticking the appropriate boxes.

- is your supervisor a member of IAS
- was this application your own initiative
- did you discuss your application with your Supervisor
- did you already had contact in the past with the Head of the Guest Department/Laboratory (if appropriate)

STUDENT BOARD



CALENDAR

1st International Congress on Stratigraphy - STRATI2013

1st-7th July 2013
Lisbon
Portugal

http://www.strati2013.org

The 10th International Conference on Fluvial Sedimentology (ICF)*

14th - 19rd July 2013
Leeds
United Kingdom

Dan Parson
d.parsons@hull.ac.uk
http://www.icfs10.co.uk/

Summer School on Speleothem Science*

28th July-2nd August 2013
Heidelberg

Michael Deininger
michael.deininger@iup.uni-heidelberg.de
www.speleothem2013.uni-hd.de

9th International Symposium on the Cretaceous System*

1st-5th September 2013
Ankara
Turkey

www.cretaceous2013.org

30th IAS MEETING OF SEDIMENTOLOGY*

2nd-5th September 2013
Manchester,
United Kingdom

Merren Jones
merren.jones@manchester.ac.uk
www.ias2013.com

7th European Symposium on Fossil Algae

9th-11th September 2013
Schladming
Austria

Hans-Juergen Gawlick
ifaa2013@unileoben.ac.at
http://web.ku.edu/~ifaa/home.html

11th Workshop on Alpine Geological Studies

9th-12th September 2013
Schladming,
Austria

Walter Kurz
alpine-workshop2013@uni-graz.at
http://alpine-workshop2013.uni-graz.at/

Second Latin American Symposium on Ichnology - Slic 2013*

13th-22nd September 2013
Santa Rosa
Argentina

Ricardo Néstor Melchor
slic2013@gmail.com
http://slic2013.wordpress.com

XI GeoSed - Meeting of Italian Association of Sedimentary Geology

22nd-28th September 2013
Roma
Italy

Marco Brandano & Salvatore Milli
marco.brandano@uniroma1.it
www.geosed.it

5th Chinese Congress of Sedimentology*

16th -20th October 2013
Hangzhou
China

Dr. Rukai Zhu
Research Institute of Petroleum E & D, PetroChina
zrk@petrochina.com.cn

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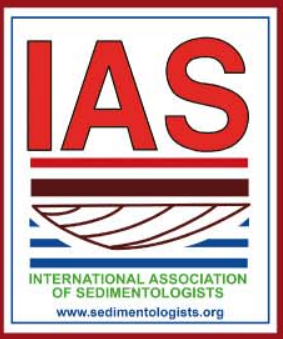
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