NOVEMBER 2011 REPORT OF TASK GROUP TO ESTABLISH THE MOSCOVIAN–KASIMOVIAN AND KASIMOVIAN–GZHELIAN BOUNDARIES

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General activities

During the last ICS fiscal year there were several geological conferences, field meetings and workshops of interest to task-group members but the most significant meetings were the "SCCS Workshop on GSSPs of the Carboniferous System: Carboniferous Carbonate Succession from Shallow Marine to Slope in Southern Guizhou Province, China" (November 22nd – 29th, 2010) and the XVII International Congress on the Carboniferous and Permian held in Perth, Australia (July 3rd - 8th, 2011).

The SCCS November workshop, held in Nanjing China consisted of two days of working sessions (examination of conodonts and other fossil groups by task-group members) and a day of oral presentations (November 24th). Several talks of interest to the task group were given including: 1) Latest Moscovian to earliest Gzhelian (Pennsylvanian) conodont faunas from the Naqing (Nashui) section, south Guizhou - by J. Barrick; and 2) *Carbonoschwagerina*-mimics from the Zhongdi section of southern Guizhou, South China and its relation with the Kasimovian-Gzhelian - K. Ueno *et al*. The workshop was followed by a six-day field excursion (November 25th to 30th) to Carboniferous and latest Devonian exposures in southern Guizhou province. The 2010 field excursion guidebook "Carboniferous carbonate succession from shallow marine to slope in southern Guizhou" edited by Wang Xiangdong *et al*. contains ten chapters dealing with conodonts and foraminifers from the Viséan-Serpukhovian, Bashkirian-Moscovian, Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries in southern Guizhou. The excursion enabled the field-meeting participants to examine the Moscovian–Kasimovian and Kasimovian–Gzhelian boundaries at the shallow-water (peritidal to nonmarine) Zhongdi section and the deep-water (carbonate slope) Nashui (Naqing) section.

At the XVII International Congress on the Carboniferous and Permian, several members gave presentations with contents directly related to the task-group activities: 1) Ueno & Task Group (2011): The Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries – an overview and progress report; 2) Leontiev & Kossovaya (2011): Preliminary data on the pre-*sagittalis* interval from the Kasimovsky quarry section, Ryazan district, Russia; 3) Qi *et al.* (2011): Progress on the study of conodonts from candidate GSSPs for the bases of Carboniferous stages in South China; 4) Ueno *et al*. (2011): *Carbonoschwagerina*-mimics from the Zhongdi section of South China: New relatives or homeomorphic strangers?; 4) Djenchuraeva & Getman (2011): Biostratigraphy of the upper Moscovian-Kasimovian boundary sediments of low foothills of the Turkestan-Alai, South Tien-Shan; and 5) Goreva & Alekseev (2011): New Russian sections as potential GSSP of the global Kasimovian and Gzhelian stages.

Progress reports from task-group members

South China. Qi Yuping, in collaboration with James E. Barrick, have been studying numerous conodont collections from the uppermost Moscovian to lower Gzhelian slope carbonates at Naqing (Nashui), southern Guizhou, South China. They consider that the FAD of *Idiognathodus turbatus* Rosscoe and Barrick 2009 is the best potential boundary marker for the base of the global Kasimovian Stage. Conodonts are abundant in the late Moscovian fauna, but they are strongly dominated by a succession of morphotypes of *Swadelina*. The Naqing *Swadelina* interval can be correlated with the Krevyakian substage in the Moscow Basin type succession and with the latest Desmoinesian in the North American succession. In the Naqing section, a new

association of *Idiognathodus* morphotypes appears at 236.0 m and elements of *Swadelina* disappear by this level. Some new morphotypes resemble the characteristic early Kasimovian species *Idiognathodus turbatus*. In the collection from 235.75 m to 236.60 m, many transitional morphotypes (which are similar to *Idiognathodus sagittalis* Kozitskaya 1978) with rapid morphological transformation from *Idiognathodus swadei* Rosscoe and Barrick 2009 to *I. turbatus* are found. Therefore, the important conodont evolutionary lineage from *I. swadei* to *I. turbatus* is confirmed in the Moscovian-Kasimovian boundary interval in the important Naqing section, South China.

The task group to establish the Kasimovian-Gzhelian boundary has selected the conodont *Idiognathodus simulator* (Ellison, 1941) (*sensu stricto*) as the event marker for defining the base of the Gzhelian Stage (Heckel *et al*., 2008) and is directing research toward selecting a suitable section for the GSSP. Within the Naqing section, Qi and Barrick investigated the conodont faunal change of the Kasimovian-Gzhelian transitional interval using additional materials. In the uppermost Kasimovian interval in the section, the less common *Idiognathodus* species include morphotypes with reduced lobes, and more significantly, forms with a weakly developed eccentric groove that could be the ancestor of *I. simulator.* After a thin (about 1.5 m thick) conodont-poor interval in the uppermost Kasimovian, diverse and abundant conodonts appear at 255.6 m and they include the first *Idiognathodus simulator*, which marks the base of the Gzhelian in the Naqing section. Therefore, the presence of the lineage of *I. simulator* from its potential ancestor has been proven using the new conodont collections from this section. Although they allow recognition of the boundary, existing collections from the Kasimovian-Gzhelian boundary interval at Naqing are not sufficient to make a complete description of the boundary conodont faunas. Qi and Barrick are working on new and larger collections from the critical boundary interval in order to obtain a more complete understanding of the conodont fauna and enable a better evaluation of the Naqing section as a stratotype section for the base of the global Gzhelian Stage.

In addition to the Naqing section, Qi Yuping recently found several new sections covering the Moscovian-Kasimovian and Kasimovian-Gzhelian boundary intervals in southern Guizhou. Among them the Narao and Fengting sections seem to be promising for further boundary work as many debris flows containing fusulines occur together with fine-grained, potentially conodont-rich limestones in both sections. The new sections probably represent shallower environments than the lithofacies in the Naqing section and present a potential for correlating the chronostratigraphic framework within the Yangtze Carbonate Platform by using conodont and fusuline biostratigraphy.

Russia. Valery V. Chernykh recently studied in detail the morphological status of "*Streotognathodus*" *simulator* (=*Idiognathodus simulator* by some authors) from the Urals and compared them with the representatives of this species from the Midcontinent region of North America. In his study, he proposed to change the diagnosis of this conodont species. This taxonomic modification would enlarge the morphological range of the relevant species, which makes it possible to explain the difference between the American and Eurasian forms as intraspecific variability. Chernykh also examined the stratigraphic value of some associated conodonts from the group *simulator* in the study. The paper will be published in Lithosphere, No. 1 in 2012.

Ukraine. Recently, Tamara I. Nemyrovska and Katsumi Ueno carried out fieldwork in the Lugansk region of the Donets Basin in Ukraine and newly studied the Annovka section in the Bryanka area. The Annovka section includes the upper part of the C2\7 Suite (Limestone M) and the C3\1 (Limestone N), broadly corresponding to the Moscovian-Kasimovian Boundary interval. Their work is still in progress.

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