

# 2008–2009 SUMMARY REPORT OF THE TASK GROUP TO ESTABLISH THE MOSCOVIAN-KASIMOVIAN AND KASIMOVIAN-GZHELIAN BOUNDARIES

K. Ueno<sup>1</sup> and the Task Group

<sup>1</sup> *Department of Earth System Science, Fukuoka University, Fukuoka 814-0180 Japan,  
e-mail: katsumi@fukuoka-u.ac.jp*

After the XVI ICCP held in Nanjing, China, in June 2007, the Task Group to establish the Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries had a workshop and general meeting at the University of Oviedo (Spain) in June 2008. This workshop was organized by former task group leader, Elisa Villa, and was attended by 13 task group members and six collaborators from the U.S.A., Russia, Ukraine, Germany, Slovenia, Spain, and Japan. At this meeting, the participants examined specimens and excellent SEM photographs of conodonts from North America, Russia, Ukraine, and Spain. They recognized that a species newly described from North America, which is similar to *Idiognathodus sagittalis* (whose first appearance constituted one of three proposals in 2004 by the Task Group for a biostratigraphic index of the Moscovian-Kasimovian boundary; see [Villa et al., 2004]), occurs also in the Moscow Basin, Southern Urals, and Donets Basin. Recently, Rosscoe and Barrick [2009] described this new species as *Idiognathodus turbatus* and established an evolutionary lineage from the ancestral *Idiognathodus swadei* to *I. turbatus*. These discoveries further resulted in the narrowing of focus in the Task Group onto two conodont taxa: *I. sagittalis* and *I. turbatus* in an interval within the lower Khamovnikian Substage. This level is approximately one-substage higher than the traditional base of the Kasimovian at the base of the Krevyakinian Substage, but it facilitates global correlation.

The first appearance datums of both *I. sagittalis* and *I. turbatus* appear to be close to each other in time, and both lie above a major stratigraphic break (major sequence boundary) that has been recognized at most sections in major sedimentary basins of the Carboniferous System. Both conodonts have their first appearance datums within the early transgressive portion of a composite stratigraphic sequence, above the unconformity that defines the sequence boundary. The typical Moscovian conodonts *Neognathodus* and *Swadelina* and the fusuline *Beedeina* became extinct below this sequence boundary. The peculiar fusuline *Fusiella rawi* appears first in an interval close to the sequence boundary. Above the sequence boundary, the first *Montiparus* (fusuline) and *Pennoceras* (ammonoid) occur. Hence, both conodont candidates are supplemented by other readily recognized biostratigraphic events in conodonts and other fossil groups.

The members of the Task Group who attended the 2008 Oviedo workshop reached unanimous agreement to focus further work on the above-mentioned two conodont species as the potential biostratigraphic marker for defining the base of the global Kasimovian Stage. Following this “unofficial” approval at that workshop, the Task Group took a vote on narrowing the focus of study to an interval of correlation that encompasses the first appearance datums of the conodonts *I. sagittalis* and *I. turbatus* for the Moscovian-Kasimovian boundary, which means to raise the potential boundary level from the traditional position at the base of the Krevyakinian, to approximately the base of the Khamovnikian. The result was: 21 task group members agreed the narrowing of the focus, 1 member disagreed, and 1 member abstained. Therefore, this issue was passed by a 95.5% majority of the 22 votes cast, which represent 91% of the total membership of the Task Group at that time.

Another important outcome of the Task Group after the Nanjing Congress is the publication of Heckel et al. [2008], which describes the formal selection of the conodont *Idiognathodus simulator* (s.s.) as the event marker for defining the base of the Gzhelian Stage. This species has been identified so far in the Midcontinent and Appalachian basins, Moscow Basin, Donets Basin, Northern and Southern Urals, and South China and now its evolutionary lineage from a probable ancestor *Idiognathodus eudoraensis* is established [Barrick et al., 2008]. The relevant conodont species has a short range and a worldwide distribution. Its first appearance is synchronous in major sedimentary basins of the Carboniferous System, based on scale correlation of

glacio-eustatic cyclothems [Heckel et al., 2007] in conjunction with several aspects of biostratigraphy, such as the distribution of Eurasian fusuline faunas (e.g., lectotype of *Rauserites rossicus*). Moreover, the first appearance datum level of *I. simulator* coincides with the base of the *Shumardites – Vidrioceras* Genozone within the evolving ammonoid zonation [Boardman, Work, 2004], which is defined by the earliest *Shumardites* (*S. cuyleri*) and *V. uddeni* and is generally regarded as the base of the Gzhelian Stage.

The choice of *I. simulator* as the event marker for the base of the Gzhelian resulted in expanding this eastern European chronostratigraphic unit to a global scale for the highest stage of the Carboniferous System. Toward the selection of a GSSP for the global lower Gzhelian boundary, two sections are currently under consideration: 1) the Usolka section near Krasnousolsk in the Southern Urals, Russia [Chernykh et al., 2006; Davydov et al., 2008], which will be visited during this SCCS International Field Meeting, and 2) the Nashui section near Luodian in Guizhou Province, South China [Wang, Qi, 2003]. The Usolka section is a rather condensed section formed in a distal slope to basinal environment, whereas the Nashui section exhibits an upper slope environment in a carbonate platform-basin setting with higher depositional rates. Several task group members are now carrying out more detailed stratigraphic, sedimentologic, and biostratigraphic works in these sections.

At the Oslo IGC meeting in August 2008, former task group chair, Elisa Villa (Spain), was succeeded by Katsumi Ueno (Japan). The Task Group currently consists of the following 24 members: A.S. Alekseev, J.E. Barrick, D.R. Boardman, V. Chernykh, V. Davydov, A. Dzhenchuraeva, H. Forke, N.V. Goreva, P.H. Heckel, T.N. Isakova, O. Kossovaya, L.L. Lambert, C.A. Méndez, T.I. Nemyrovska, Qi Yuping, S. Remizova, S. Roscoe, E. Samankassou, L.C. Sánchez de Posada, J. Sanz, K. Ueno, E. Villa, G. Wahlman, and D.M. Work. We are now taking new steps toward choosing the fossil marker event to define the base of the global Kasimovian Stage, and toward selecting GSSPs for both the base of the Kasimovian and the base of the Gzhelian.

## References

- Barrick J.E., Heckel P.H., Boardman D.R.** Revision of the conodont *Idiognathodus simulator* (Ellison 1941), the marker species for the base of the Late Pennsylvanian global Gzhelian Stage // *Micropaleontology*. 2008. V. 54. No 2. P. 125–137.
- Boardman D.R., Work D.M.** Stratigraphic distribution of the ammonoids *Shumardites* and *Vidrioceras* and implications for the definition and correlation of the global Gzhelian Stage, Upper Pennsylvanian Series // *Newsletter on Carboniferous Stratigraphy*. 2004. V. 22. P. 23–27.
- Chernykh V.V., Chuvashov B.I., Davydov V.I., Schmitz M., Snyder W.S.** Usolka section (Southern Urals, Russia): a potential candidate for GSSP to define the base of the Gzhelian Stage in the global chronostratigraphic scale // *Geologija*. 2006. V. 49, No 2. P. 205–217.
- Davydov V.I., Chernykh V.V., Schmitz M., Snyder W.S., Chuvashov B.I.** Faunal assemblage and correlation of Kasimovian-Gzhelian transition at Usolka Section, Southern Urals, Russia (a potential candidate for GSSP to define base of Gzhelian Stage) // *Stratigraphy*. 2008. V. 5, No 2. P. 113–136.
- Heckel P.H., Alekseev A.S., Barrick J.E., Boardman D.R., Goreva N.V., Nemyrovska T.I., Ueno K., Villa E., Work D.M.** Cyclothem [“digital”] correlation and biostratigraphy across global Moscovian-Kasimovian-Gzhelian Stage boundary interval (Middle-Upper Pennsylvanian Series) in North America and eastern Europe // *Geology*. 2007. V. 35. No 7. P. 607–610.
- Heckel P.H., Alekseev A.S., Barrick J.E., Boardman D.R., Goreva N.V., Isakova T.N., Nemyrovska T.I., Ueno K., Villa E., Work D.M.** Choice of conodont *Idiognathodus simulator* [*sensu stricto*] as the event marker for the base of the global Gzhelian Stage (Upper Pennsylvanian Series, Carboniferous System) // *Episodes*. 2008. V. 31. No 3. P. 319–325.
- Roscoe S.J., Barrick J.E.** Revision of *Idiognathodus* species from the Middle-Upper Pennsylvanian boundary interval in the Midcontinent basin, North America // *Paleontographica Americana*. 2009. No 62. P. 115–147.
- Villa E., Task Group.** Progress report of the Task Group to establish the Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries // *Newsletter on Carboniferous Stratigraphy*. 2004. V. 22. P. 14–16.
- Wang Z.H., Qi Y.P.** Upper Carboniferous (Pennsylvanian) conodonts from south Guizhou of China // *Rivista Italiana di Paleontologia e Stratigrafia*. 2003. V. 10/9. No 3. P. 379–397.