



Annual Report* of IGCP Project No. 608

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 by 01/12/2016

A LIST OF PUBLICATIONS HAS TO BE ADDED AS AN ANNEX.

***REMINDER: IF THIS IS THE FINAL YEAR OF YOUR PROJECT, PLEASE SUBMIT A REVIEW ARTICLE ABOUT YOUR PROJECT TO THE IUGS JOURNAL 'EPISODES'.**

The scientific information in this report will further be used for publication on the IGCP website hosted at UNESCO (please feel free to attach any additional information you may consider relevant to the assessment of your project).

IGCP project short title: Asia-Pacific Cretaceous Ecosystems

Duration: 2013 - 2017

Please tick this box if the report is for a Project on extended term (OET):

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2016 Annual Report of IGCP608

1. **Website address(es) related to the project** <http://igcp608.sci.ibaraki.ac.jp/>

2. **Summary of major past achievements of the project**

Since the approval of our project proposal in March 2013, we started to exchange and share the project information and our activities through the website above and e-mail in correspondences (mailing list). Brief meeting reports, photos taken in the meetings and publication lists as well as meeting announcements, and project annual reports are uploaded relatively frequently. Our site is mutually linked with two sister project of IGCP609 and 632.

The first, second and third international meetings were held at 1) Birbal Sahni Institute of Palaeobotany (BSIP), Lucknow, India (Dec. 20-27, 2013), 2) Waseda University, Tokyo, Japan (Sep. 4-10, 2014) and 3) Liaoning Mansion Hotel and Paleontological Museum of Liaoning, Shenyang, China (Aug. 16-20, 2015), respectively. A total of 45, 92 and 146 scientists, students and geologists of petroleum companies attended the meeting, respectively. Their meetings were reported on the website briefly and the articles of *News of Geological Society of Japan* and *Fossils* (Japanese journal of Palaeontological Society) closely. Their abstracts volumes and field guides except the third meeting can be downloadable on the website. The proceedings volume of the first and second meetings has been published as a thematic section of *Island Arc* (Wiley Online Journal).

Peter R. Crane (Yale Univ.), a co-worker of Masamichi Takahashi (Niigata Univ., Japan), received the 30th International Prize for Biology (Japan Society of Promotion of Science) in Dec. 2014 for his great contribution to plant systematics and evolutionary, especially on the origin of angiosperm during the Cretaceous. Their Cretaceous paleobotanical studies in Japan and Mongolia were based on our Asian IGCPs including the previous IGCP507 and 434.

3. **Achievements of the project this year only**

3.1. *General scientific achievements*

The current state-of-the-art knowledge of Cretaceous Land, Ocean, Biosphere and Ecosystems in each participating country has been gathered in addition to regular research results at seven meetings listed in the next section. In the Fourth International Symposium we overviewed such the topics as 1) biodiversity of terrestrial and marine ecosystems, 2) Cretaceous paleogeography and paleobiogeography, 3) Cretaceous climate and environmental changes, 4) Cretaceous stratigraphy and sedimentology and Cretaceous vertebrates of Asia and the Western Pacific. We understood the further and comprehensive studies through integrated approach are necessary for the better understandings of the Cretaceous paleoenvironments and the paleoecosystems in Asia.

During a post-symposium field excursion, we visited Kemerovo Regional Museum of Local Lore and Shestakovo dinosaur localities of the Lower Cretaceous Ileik Formation. Newly reconstructed skeletons of *Psittacosaurus sibiricus* as well as fragmentary and smaller-sized mammalian bones such as tricodont and tritylodont recently exhibited in the museum are very crucial to reconstruct the vertebrate fauna in Early Cretaceous Siberia and Asia. We observed a few dinosaur bone bed horizons within red-colored flood-plain mudstone, showing the fluvial taphonomic processes forming the dinosaur bone beds. It suffices to understand the significance of the Ileik Formation as one of the important dinosaur fossil sites in Russia and the value of the Shestakovo fauna in representing Cretaceous ecosystems in West Siberia.

In the firstly held Joint Symposium of IGCP608, IGCP609 and ICDP Songliao Basin, "Cretaceous sea-level changes and Asia-Pacific Cretaceous Ecosystems" during 35th IGC. We communicated each other and shared scientific knowledge and information ongoing in each researcher and research group.

The proceedings volume of the first and second meetings has been published as a virtual issue for the Thematic Section "Land-Ocean Linkages and Biotic Evolution during the Cretaceous: Contribution from Asia and Western Pacific" of *Island Arc*. Other many related research results by our members are published in several international and domestic journals

listed as Appendices 1 and 2 greater than last year in number of pages, showing very active scientific efforts individually or with elaborated domestic and international cooperation.

3.2. List of IGCP project meetings/symposia and IGCP related meetings/symposia with exact attendance (if possible) and number of countries

- 1) [Fourth International Symposium of IGCP608](#), August 15-17, Trofimuk Institute of Petroleum Geology and Geophysics of Siberian Branch of Russian Academy of Sciences (IPGG SB RAS) in Novosibirsk, Russia. 60 participants including 28 women from 8 countries. (App.4-7)
- 2) Post-symposium three-days field excursion, August 18-20, guided by Boris Shrygin, to Kemerovo Regional Museum of Local Lore and Shestakovo dinosaur localities. A total of 18 overseas participants (6 countries) and 16 Russian participants. (Appendix 8)
- 3) [Joint Symposium of IGCP608, IGCP609 and ICDP Songliao Basin, "Cretaceous sea-level changes and Asia-Pacific Cretaceous Ecosystems \(IGCP 609, IGCP 608, ICDP Songliao basin\)"](#), 31 August and 1 September in 35th IGC, Cape Town, South Africa. A total of about 50 people gathered including three projects from 14 countries at least.
- 4) International Symposium on "Dinosaur Reproduction" (Appendix 15) on 24 June during Annual Meeting of the Palaeontological Society of Japan at Institute of Dinosaur Research, Fukui Prefectural University, Fukui, Japan. Five invited guest speakers (five countries) and about 100 Japanese participants.
- 5) Cretaceous symposium "Current status of Cretaceous stratigraphy, paleontology and studies on environmental changes in Japan" at 165th Meeting of Palaeontological Society of Japan, 29 January 2016, Kyoto University, Japan. About 100 Japanese participants.
- 6) Topic session (mini-symposium) "Earth System during Greenhouse Earth Era", during 2nd Annual Meeting of the Paleosciences Society, 26 November, 2016, Waseda University, Tokyo, Japan. About 50 Japanese participants.
- 7) JpGU-AGU Joint Session in Japan Geoscience Union Meeting 2016 (Appendix 16), M-IS02 "[IGGP \(International Geosciences and Geoparks Programme\) of the future](#)", 24 May, 2016, Makuhari Messe, Chiba, Japan. About 40 persons mostly Japanese including H. Ando and four invited foreign speakers (three countries) including Dr. P. J. McKeever.
- 8) 8th All-Russian meeting "Cretaceous System of Russia and CIS countries: problems of stratigraphy and paleogeography", 28 Sep.-3 Oct., Republic Crimea, Russia (Appendix ??). About 150 participants from Russian and some CIS countries.

3.3. Educational, training or capacity building activities related to the IGCP project and IGCP project participants.

Several PhD, M.Sc. and Bachelor programs are attended by members from universities and research institutes of several countries having for subject the research and education of Cretaceous geology and palaeontology. Several students obtained PhD and M.Sc. degrees through cooperative inter-college and international research.

Cretaceous related excursions and Geopark-tours took place, organised by universities, museums and academic societies in some countries (China, India, Japan and Korea) thanks to concerned efforts by our IGCP members. Especially in Japan, a session entitled "[IGGP \(International Geosciences and Geoparks Programme\) of the future](#)" was held during Japan Geoscience Union Meeting (), and Dr. P. J. McKeever and H. Ando provided an introductory talk about UNESCO Global Geoparks and IGCP608 activities, respectively. Furthermore, two IGCP608 members (A. Matsuoka, Japan and E. V. Bagdaeva, Russia) and Dr. McKeever presented keynote speeches in [Geoparks Niigata International Forum](#) on 27 July.

In Cretaceous symposium "Current status of Cretaceous stratigraphy, paleontology and studies on environmental changes in Japan" at the 165th Meeting of the Palaeontological Society of Japan organized by IGCP608 members (H. Ando, T. Hasegawa and H. Nishi), seven comprehensive research review talks were presented by IGCP608 members for sharing the up-to-date knowledge of Cretaceous geosciences in Japan.

*3.4. List of countries involved in the project (please *indicate the countries active this year*

*China, *India, Iran, *Japan, *Korea, *Malaysia, *Mongolia, Myanmar, *Pakistan,

Form V

*Philippines, *Russia, *Thailand, Vietnam, *Australia, *France, New Zealand, Romania, Spain, Switzerland, United Kingdom, Canada, U.S.A.

3.5. Participation of scientists from developing countries, and in particular young and women scientists: exact number and please describe how this project specifically benefited women scientists, young scientists and/or scientists from developing countries

	Total number of scientists	Number of male scientists	Number of female scientists
Number of participating scientists	261	206	55
Number of young scientists/students (<35 years old)	52	34	18
Number of scientists from developing countries	102	78	24

3.6. List of the 5 most important publications (including maps) of this year

- 1) Dzyuba, O.S., Pestchevitskaya, E.B. and Shurygin, B.N., eds., 2016, *Cretaceous Ecosystems and Their Responses to Paleoenvironmental Changes in Asia and the Western Pacific*: Short papers for the Fourth International Symposium of IGCP Project 608, August 15–20, 2016. Novosibirsk, IPGG SB RAS, 134 p. (ISBN 978-5-4262-0073-9) (Appendix 7)
- 2) Lebedeva, N.K., Yan, P.A., Feofanova, O.A., Kuzmina, O.B., Goryacheva, A.A. and Demidenko, N.V. 2016. *Cretaceous dinosaur-bearing deposits in Kemerovo Oblast*: Field Excursion Guidebook. Fourth International Symposium of International Geoscience Programme IGCP Project 608, August 15-20, 2016. Novosibirsk, IPGG SB RAS, 10 p. (ISBN 978-5-4262-0072-2) (Appendix 8)
- 3) Goedert, J., Amiot, R., Boudad, L., Buffetaut, E., Fourel, F., Godefroit, P., Kusuhashi, N., Suteethom, V., Tong, H., Watanabe, M.E. and Lécuyer, C., 2016a, Preliminary investigation of seasonal patterns recorded in the oxygen isotope composition of theropod dinosaur tooth enamel. *Palaios* **31**, 10–19. (collaborative researches among several countries) (Appendix 9)
- 4) Wang Pu-Jun, Mattern Frank, Didenko N. Alexei, Zhu De-Feng, Singer Brad, Sun Xiao-Meng, 2016, Tectonics and cycle system of the Cretaceous Songliao Basin: An inverted active continental margin basin. *Earth-Science Reviews*, **159**, 82-102. (comprehensive)(App.10)
- 5) Yoshino, K. and Matsuoka, A., 2016, Mode of occurrence and taphonomy of the heteromorph ammonite *Pravitoceras sigmoidale* Yabe from the Upper Cretaceous Izumi Group, Japan. *Cretaceous Research*, **62**, 74-85.(phD student's paper)(Appendix 11)

* Full publication lists of IGCP608 members are attached as Appendices 1 and 2

3.7. Activities involving other IGCP projects, UNESCO, IUGS or others

As several members of IGCP608 have also joined two IGCP609 and 632 due to closely related scientific scopes and targets, their information on meetings and others is shared and circulated among members. We have several chances to attend a wide-range of meetings. During the 35 IGC, we held [Joint Symposium of IGCP608, IGCP609 and ICDP Songliao Basin, "Cretaceous sea-level changes and Asia-Pacific Cretaceous Ecosystems \(IGCP 609, IGCP 608, ICDP Songliao basin\)"](#), 31 August and 1 September in 35th IGC, Cape Town, South Africa. As IGCP632 also held its own sessions separately, several members of three IGCPs joined the sessions mutually and shared our scientific information and development.

In Japan a total of six Japanese National Geoparks highlighting Cretaceous strata such as "[Dinosaur Valley Fukui Katsuyama](#)", "[Hakusan Tedorigawa](#)", "[Amakusa](#)", "[Choshi](#)", "[Sanriku](#)" and "[Mikasa](#)" Geoparks have been certificated by [Japanese Geopark Network](#). IGCP608 members have been also much involved in several activities as well as scientific advice.

3.8. *Scientific Legacy: Is there a need for storage of publications, field data, and other results of the project?*

The abstract volumes and field guides of meetings are unloadable as pdf files on the [IGCP608 website](#) on a server of Ibaraki Univ. They will be maintained possibly until a few years after our project at least (retirement of H. Ando). If some legacy storage is kept long-term in IGCP under UNESCO similar to IODP, it will be much welcome and useful.

3.9. *What tangible improvements has your project obtained?*

The project provides a valuable role in promoting communication at the level of Cretaceous geoscience among the various Asian countries, including some countries outside Asia. Young scientists and students as well as newly involved scientists are expected to have significant experiences to join the international symposium, field surveys and laboratory works. We can share the current status of the Cretaceous studies and their background for research condition in each country through cooperative researches especially during the international meetings as well as field excursions and museum visits.

The proceedings volume to *Island Arc* is a great opportunity for non-native English speaking Asian scientists, to contribute their scientific endeavour to international journals. Now more than 10 manuscripts are under review other than accepted six ones.

3.10. *What kinds of activities in respect to the benefit of society and science outreach has your project undertaken?*

As several members of IGCP608 in China, Japan, Korea and have been much involved in several activities of Geoparks for enhancing public awareness of geosciences and geological significance of geosites, by providing scientific advice, excursion guide, lecture, symposium keynote, etc.

Several members working for museums and universities have been taken some efforts to enhance public awareness of the significance of Cretaceous geology and paleontology, by providing public lectures, study tours, excursions, specimens, etc. in local field survey and excavation areas, as Cretaceous biota and strata generally attract public and school children.

3.11. *What kind of public information (media reports, etc) has your project generated? And how do you evaluate their impact?*

Our project information including meetings and publication lists has been frequently updated on the [project website](#) with [links](#) to [IGCP609](#) and [632](#), as well as Geoparks Network (Global and Japanese), some scientific organization and societies. This website acts as a platform to recognize our IGCP608 activities for public as well as members.

During the excursion, our visit to Kemerovo region was taken up on several local media as TV and newspapers (Appendix 19). Following the kind support from Kemerovo Regional Museum of Local Lore and Kemerovo local governmental authorities including Shestakovo Village, the field guides arranged for our excursion itself to encourage their activities on dinosaur exhibition and excavation, and promote public education based on such their geoheritage.

4. Activities planned

4.1. General goals

Following the previous meetings in India (2013), Japan (2014), China (2015) and Russia (2016), the spatio-temporal paleo-environmental and paleo-ecosystem changes during the Cretaceous in the South to East Asia and Western Pacific region will be delineated on the basis of paleo-proxy data and a diversified fossil record. As participants from East to Southeast Asia may not be adequately familiar with Korean geology and paleontology, we will focus on the Korean Cretaceous sedimentary basins and their tectonic paleogeographic aspects as well as other continental basins nearby. The field excursion will visit the Lower Cretaceous lake and terrestrial strata in south coast of Korean Peninsula bearing many dinosaur footprint and eggshell horizons, being important for reconstructing Cretaceous ecosystems in Korea and the surrounding regions as Japanese Islands and NE China. On the other hand, during an IGCP608

session in 10th International Symposium in Vienna this August, we, mainly Asian geoscientists will learn about the current status of Cretaceous geosciences in the world.

After publishing Thematic Sections of *Island Arc* as proceedings volumes, we will plan to make our next scientific publication covering our research results.

4.2. Tentative list of specific meetings and field trips (please list the participating countries)

- 1) [Fifth International Symposium, October 25-27, 2017](#), ICC (International Convention Center) Jeju, South Korea (Republic of Korea). Filed excursion will go around Cretaceous Sedimentary Basins (Kyopo and Gyeongsang basins) in western and southern Korea, during 22-24 October. Some places of Jeju Island Global Geopark will be included in the course. Organizing Committee will be chaired by Daekyo Cheong (co-leader, previous president of GSK) and Geological Society of Korea (as 70th Anniversary Memorial Symposium of GSK; President: Prof. Min Huh, member of IGCP608).
Participating countries: China, India, Iran, Japan, Korea, Malaysia, Mongolia, Myanmar, Pakistan, Philippines, Russia, Australia, France, Switzerland, U.S.A.
- 2) Session of IGCP608 “Asia-Pacific Cretaceous Ecosystems (IGCP608)” during [10th International Symposium on the Cretaceous \(10th ISC 2017\)](#), August 21–26, 2017, Vienna, Austria. As IGCP609 as well as ICDP Songliao basin will hold their sessions, we may exchange scientific knowledge each other.
Participating countries: China, India, Japan, Korea, Mongolia, Philippines, Russia, Thailand, Australia, France, Romania, Switzerland, United Kingdom, U.S.A., etc.
- 3) [Fifth Symposium of IGCP632 “Continental Crises of the Jurassic: Major Extinction Events and Environmental Changes within Lacustrine Ecosystems: Jurassic Tropical to Polar Biotic and Climatic Transects”](#), hosted by the Museum of Northern Arizona and Northern Arizona University, Flagstaff, Arizona, USA, September 30 – October 1, 2017
Participating countries: China, Japan, Korea, Mongolia, Russia, U.S.A
- 4) [8th International Conference on Global Geoparks 2018](#), Adamello-Brenta UNESCO Global Geopark, Italy in September 2018.
Participating countries: China, Japan, Korea

5. Project funding requested

To support about ten scientists and students (especially from Iran, Malaysia, Thailand, Vietnam and Mongolia) for travel expenses of the Fifth International Symposium and Field Excursion in Korea and the Organizing Committee for meeting expenses, we request project funding of \$10,000 for 2017.

6. Request for extension, on-extended-term-status, or intention to propose successor project

N/A

7. Financial statement (\$ USD only)

The IGCP fund (\$8000) has been used to support travel expenses and accommodation for eight scientists from Thailand (two), India (four), Mongolia (one) and Russia (one), and to organize the meeting, and to maintain website updating. (Form III)

8. What additional funding besides the IGCP seed funding has your project obtained thanks to the IGCP label? Please estimate the budget received for meetings, research or other and identify the source.

The fourth meeting in Russia was financially supported from the Russian Foundation for Basic Researches (about \$3,000). The organizing committee made effort to have much support from the Kemerovo Regional Museum and Kemerovo local government authorities for food, lunch and some refreshments, etc., though difficult to be evaluated in terms of money.

The additional funds (JPY 500,000 totally) for IGCP608 were received from some geo-engineering companies in Japan. When the leader (H. Ando) makes requests for funding, our abstract volume and field guide with IGCP and UNESCO logos and some published reports are effective for recognition of our activities.

9. Attach any information you may consider relevant

Appendix 1: List of important publications

Appendix 2: Activity reports from national working groups

Appendix 3: Financial Request for IGCP608 in 2017

Appendix 4: [Second Circular of Fourth International Symposium of IGCP608](#)

Appendix 5: [Third Circular of Fourth International Symposium of IGCP608](#)

Appendix 6: Programme of Fourth International Symposium of IGCP608 (Final)

Appendix 7: [Abstract volume of Forth International Symposium of IGCP608](#)

Appendix 8: [Field Excursion Guide of Forth International Symposium of IGCP608](#).

Appendix 9: Goedert, et gl., 2016, *Palaios* **31**, 10–19.

Appendix 10: Wang P.J., et al., *Earth-Science Reviews*, **159**, 82-102.

Appendix 11: Yoshino, K. and Matsuoka, A., 2016, *Cretaceous Research*, **62**, 74-85.

Appendix 12: Article copy of Meeting Report for the Third Meeting of IGCP608 on *Fossils* (Paleontological Society of Japan), No.99, 115-117, March, 2016

Appendix 13: [Article copy of Meeting Report for the Fourth Meeting of IGCP608 on News of Geological Society of Japan, Vol.19, No.10, 4-5, October, 2016](#)

Appendix 14: Flyer of Workshop for Cretaceous Climate (28 March, 2016, JAMSTEC HQ, Japan)

Appendix 15: Poster of “Symposium on Dinosaur Reproduction” in the Annual Meeting of Paleontological Society of Japan (24 June, 2016, Fukui Prefectural University)

Appendix 16: Session information of “IGGP of the future” in Japan Geoscience Union Meeting2016 (24 May, 2016, Makuhari Messe, Chiba, Japan)

Appendix 17: [2nd Circular of “Geoparks Niigata International Forum”](#) (27-29 July, 2016, Toki Messe, Niigata Convention Center, Niigata, Japan)

Appendix 18: Program of 8th All-Russian meeting “Cretaceous System of Russia and CIS countries: problems of stratigraphy and paleogeography” (28 September-3 October, Republic Crimea, Russia)

Appendix 19: Several news copies of local newspaper, web news and TV in Kemerovo region, Russia during field excursion, 18-20 September, 2016.

Appendix 20: Web news of “The Dong-A Ilbo” (one of major Korean newspapers), showing lizard tracks discovered firstly in Asia from Lower Cretaceous strata in Korea (9 September 2016)

Appendix 21: Newspaper copy of ‘The Hitavada’, Nagpur edition (17 February, 2016), introduced as an article ‘Dinosaurs became extinct 65 million years ago due to Deccan Volcanic eruption’

Appendix 22: Exhibition report titled “Exhibiting the polar dinosaurs from Australia – the dinosaurs of darkness” provided by Vickers-Rich P. (Monash University, Australia)

Appendix 23: PrimeSCI! 2014-2015 Annual Report, Monash University, Australia, provided by Vickers-Rich P.