

INTERNATIONAL GEOSCIENCE PROGRAMME (IGCP)



Annual Report* of IGCP Project No 587

IGCP project short title: **Of Identity, Facies and Time: The Ediacaran (Vendian) Puzzle**

Duration: 5 years

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Name: Prof. Patricia Vickers-Rich (see above)

Date of submission of report: 22 December 2010

Signature of project leader:

Patricia V. Rich

Annual Report

(December 2010)

1. Website address related to the project:

www.geosci.monash.edu.au/precsite

2. Summary of major past achievements of the project:

This is the first year of the project. It followed on IGCP493 and all the reports from this past project can be accessed on the website:

www.geosci.monash.edu.au/precsite

3. Achievements of the project this year only

3.1 Countries Involved. *Saudi Arabia, *Argentina, *Australia, *Brasil, *Canada, *China, *Germany, *India, Iran, Iraq, Ireland, *Italy, *Japan, *Namibia, The Netherlands, *Poland, *Russia, *Spain, *Sweden, *South Africa, *Taiwan, *United Kingdom, *USA, *Uruguay.

3.2. General scientific achievements and social benefits. A significant number of **research papers** were generated by the participants in this project, some examples of which will be given in 3.6. In addition **four exhibitions** were fielded during 2010: *Wildlife of Gondwana* (with venues in Singapore, Adelaide and Darwin, Australia), *O Mundo Perdido Timor-Leste* (a major upgrade for the ConocoPhillips sponsored geology exhibition in Dili and two small regional exhibitions in the towns of Aileu and Baucau in Timor-Leste) and another launched in Melbourne at the Monash Science Centre, Monash University – *The Artist and the Scientists. Upstream/Downstream*. The latter exhibition was a investigation into the flow on use of the scientific art of Peter Trusler, who has crafted many of the art pieces used in publications dealing with Neoproterozoic life. The catalogue for this last exhibition is the book *The Artist and the Scientists. Bringing Prehistory to Life* by Peter Trusler, Patricia Vickers-Rich and Thomas H. Rich, published in late 2010 by Cambridge University Press. Another publication of translation significance was the 2nd volume of *A Chinese/English and English/Chinese Dictionary of Paleontological Terms*. The two volumes now cover both vertebrate and invertebrate terminology, the end of a project which began in 1982, joint between Monash University in Melbourne, Cambridge University and the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing. This has now been placed on line and can be accessed through the website of IGCP587. Proposed, aided in the planning and production of David Attenborough's *First Life* documentary released in late 2010 by the BBC and Atlantic Productions.

The research of Guy Narbonne and Jim Gehling were featured in this beautiful conclusion of Attenborough's *Life* series (http://news.bbc.co.uk/earth/hi/earth_news/newsid_9118000/9118606.stm). A CBC documentary "Mistaken Mystique" explored how the fossils at Mistaken Point have influenced the international scientists, local community, and Newfoundland artists.

3.3 List of meetings with attendance and number of countries. The principal meeting of 2010 was *Precambrian Life, Time, and Environment: Evolving Concepts and Modern Analogues* held in Lucknow from 2-9 Feb. This meeting involved a field trip to the Sub-Himalayas (see website for more detail) examining a wide range of topics related to the Neoproterozoic sequences that crop out in this region – the Krol Belt in which Cryogenian Pre-Blani to Tal Formations are exposed. This was a meeting in conjunction with IGCP512. A second field meeting to examine the late Neoproterozoic sections in Rajasthan had to be rescheduled for early 2011 and funding was used to bring young scientists from both Russia and India to attend this conference. **See form for this meeting submitted to IUGS on 26 July 2010, and attached.** Upwards of 100 were in attendance at the meeting in Lucknow with representatives from North America, Europe, Australia, China and India. The meeting planned for the Flinders Ranges was not run due to the conflict of schedules of several of the participants and so delayed until 2011 or 2012 with the prospect of running it in concert with the IGC to be held in Brisbane in 2012.

3.4 Educational, training or capacity building activities. In the group of participants in the Sub-Himalayas led by V. Rai and colleagues, a number of students were involved and so the experience acted as a significant platform for international exchange. In the set up and delivery of the exhibitions in Australia, Singapore and Timor-Leste, opportunities were provided for capacity building in research training and in exhibition outreach training. Another event attended by members of IGCP587 was to take part in the Timor-Leste Pavilion at the Shanghai World Expo working with young children attendees in geology-based activities – such as preparing casts of Ediacaran material. Each child prepared a cast from moulds made of Australian Ediacaran taxa and was able to take this along with a copy of *O Mundo Perdido Timor Leste* with them as a memento of their visit to the Expo – an event which took place in September 2010.

3.5 Participation of scientists from developing countries, and in particular young and women scientists. With the field trip/conference in India and the exhibition activities listed in 3.2 and 3.4 there were a number of women, young scientists and even primary, secondary and tertiary level students involved. In particular, Timor-Leste was a wonderful opportunity to interact with young men and women in a developing country atmosphere. The publication of *O Mundo Perdido Timor-Leste. A Boy and Crocodile Travel Through Time* (now translated into Tetun, Portuguese, English, Chinese, Arabic, Spanish, and Slovenian with Hebrew, Tamil, Farsi, German and French translations underway), the geology of a developing country is centerpoint. This little book is written by the President of Timor-Leste and Nobel Peace Prize Recipient, Jose Ramos-Horta and Patricia

Vickers-Rich with art by Peter Trusler and at a primary and secondary level.

3.6. List of most important publications (including maps). Only a few of a considerable number of publications by participants in IGCP587 will be listed due to the constraints of the 5 pages. Also see above.

Book

Trusler, P., Vickers-Rich, P & Rich, T. H., 2010. *The Artist and the Scientists. Bringing Prehistory to Life.* Cambridge University Press, pp. 308.

Peer Reviewed Research Papers

Gostin, V. A., McKirdy, D. M., Webster, L J. & Williams, G. E., 2010. Ediacaran ice-rafting and coeval asteroid impact, South Australia: insights into the terminal Proterozoic environment. *Australian Journal of Earth Sciences*: 57: 7, 859-869.

Hofmann, H. J. & Mountjoy, E. W., 2010. Ediacaran body and trace fossils in Miette Group (windermere Supergroup) near Salient Mountain, British Columbia, Canada. *Canadian Journal of Earth Sciences*, 47: 1305-1325.

Laflamme, M., 2010, Wringing out the oldest fossil sponges, *Nature Geoscience* 3: 597-598.

Liu, A.G., McIlroy, D., and Brasier, M.D. 2010. First evidence for locomotion in the Ediacara biota from the 565 Ma Mistaken Point Formation, Newfoundland, *Geology* 38:123-126.

Narbonne, G.M., 2010, Neoproterozoic oceans and early animals. *Science* 328: 53-54.

Silva-Tamayo, J.C., Nägler, T.F., Sial, A.N., Nogueira, A. Kyser, T.K., Riccomini, C., James, N.P., Narbonne, G.M., Villa, I.M., 2010, Global perturbation of the marine Ca isotopic composition in the aftermath of the Marinoan global glaciation. *Precambrian Research*, 182: 373-381.

Silva-Tamayo, J. C., Nägler, T. F., Villa, I. M., Kyser, T.K., Vieira, L. C., Sial, A. N., Narbonne, G. M., and James, N. P. 2010. Global Ca isotope variations in c. 0.7 Ga old post-glacial carbonate successions. *Terra Nova* 24: 188-192.

Schmidt, P. W. & Williams, G. E., 2010. Ediacaran palaeomagnetism and apparent polar wander path for Australia: no large true polar wander. *Geophysical Journal International*, doi:10.1111/j.1365-246X.2010.04652.x: 1-16.

Schmidt, P. W. & Williams, G. E. & McWilliams, M. O., 2009. Palaeomagnetism and magnetic anisotropy of late Neoproterozoic strata, south Australia: Implication for the palaeolatitude of late Cryogenian glaciations, cap carbonate and the Ediacaran System. *Precambrian Research*, 174: 35-52.

Tewari, V. C., 2010. Terminal Neoproterozoic (Ediacaran) Chemostratigraphy of the Lesser Himalaya, India. *Journal of the Indian Geological Congress*, 2 (1): 69-93.

Zalba, P. E., et al., 2010. Preservation of biogenerated mixed facies: A case study from the Neoproterozoic Villa Monica formation, Sierra La Juanita, Tandilla, Argentina. *Journal of Applied Sciences*, 10 (5): 363-379.

3.7. Activities involving other IGCP projects, UNESCO, IUGS or others. See above for exhibition and publication activities related to/but outside the

boundaries of the IGCP. In addition to this many of the participants presented public lectures around the globe, examples including titles such as: *In Search of Ghosts. Trying to Find the First Animals* (Royal Society of New South Wales, Australia), *Reading Rocks – Uncovering the Secrets of Past and Educating* (Singapore Science Centre), *The Wandering Path of a Rock Whisperer* (South Australian Museum, Adelaide and Singapore Science Centre), *The Rise of Animals* (Institute of Paleobiology, Polish Academy of Sciences, Warsaw), etc. See 3.3 for cooperation with IGCP512.

4. Activities planned

4.1. General goals. To continue to provide a platform upon which discussion concerning changing environments and climate has affected the evolution of animals and the biota in general. This is being done by organizing a series of meetings and field work globally, concentrating in particular on the youngest and oldest occurrences of the Ediacaran (Vendian) time periods. See website for more specific goals detailed in 8.1 of Aims and Background for this project.

4.2. Tentative list of specific meetings and field trips. Three events minimum are planned for 2011 – one taking place in the Urals (a conference and field excursion based out of Novosibirsk), another in India (a field excursion in western India – Rajasthan) and a third in southern Namibia. A multinational team will be taking part in each involving the countries of: Russia, Namibia, Australia, Germany, Canada, USA, Spain, India, UK, amongst others. Major events are planned for the Geological Association of Canada annual meeting in St. John's in May 2012. These include a pre-meeting fieldtrip to the basal Cambrian GSSP on the Burin Peninsula (P. Myrow and G.M. Narbonne), the Hans Hofmann Memorial Session on Precambrian Paleontology during the meeting (J.G. Gehling and G.M. Narbonne), and a post-meeting trip through the Ediacaran of the Avalon Peninsula (G.M. Narbonne, J.G. Gehling, M. Laflamme, and R. Thomas).

5. Project funding requested: \$10,000.00 US

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

Not Applicable

7. Financial statement (\$ USD only). See attached

8. Attach any information you may consider relevant.

a. Previously submitted Meeting Report for Indian Meeting in Lucknow, Feb. 2010.

b. Financial Statement for 2010.

c. Description of content of *The Artist and the Scientists. Bringing Prehistory to Life*, published by Cambridge University Press.

d. Brochure for the content of *Wildlife of Gondwana. A Geological Exhibition*.

e. Canadian Group Report (Narbonne)