

IGCP 587 – "Identity, Facies and Time, the Ediacaran (Vendian) Puzzle" 2011 Report on Canadian Activities

Publications:

Three refereed journal publications with Canadian authors came out in 2011, as listed below:

Laflamme, M., Schiffbauer, J. D., Narbonne, G. M., and Briggs, D. E.G., 2011, Microbial biofilms and the preservation of the Ediacara biota. *Lethaia* 45: 203-213.

Liu, A., McIlroy, D., Antcliffe, J., Brasier, M. 2011. Effaced preservation in the Ediacara biota and its implications for the early macrofossil record. *Palaeontology* 54: 607-630.

Narbonne, G.M., 2011, When life got big. *Nature* 470: 339-340.

Papers in press for 2012 include a new Ediacaran taxon from Mistaken Point, a reinterpretation of the enigmatic fossil *Ivesheadia*, and Chapter 18 (Ediacaran Period) in *A Geologic Timescale 2012*.

Research Activities:

Newfoundland - Research by G.M. Narbonne and his team (Queen's University) at Mistaken Point focussed on the sedimentology of fossiliferous Ediacaran strata on Bonavista Peninsula and the taxonomy of the small fronds at Mistaken Point. D. McIlroy (MUN) is also carrying out field studies of the fossils at Mistaken Point and elsewhere in eastern Newfoundland.

NW Canada – The Mackenzie Mountains of NW Canada contain a superb record of Ediacaran evolution in a well-preserved succession readily amenable to geochemical analysis. G.M. Narbonne (Queen's University) coordinated his paleontological studies with a simultaneous Harvard University study of geochemical proxies for oceanographic conditions. This coordinated effort will provide an outstanding record of oceanographic and biological changes throughout the entire Ediacaran Period in a deep-water, open ocean setting.

Namibia - G.M. Narbonne (Queen's University) was part of a multinational team (Australia, Canada, Namibia, Russia, Taiwan) studying Ediacaran fossils in southern Namibia. Narbonne's activities focussed on the enigmatic Ediacaran fossil *Rangea* and on evaluation of the conservation of Swartpunt 15 years after the remarkable fossil finds.

Education:

As part of our role in a project to cast most of the E-surface at Mistaken Point for posterity, Queen's University was able to obtain a 4 square meter cast that is astonishingly realistic in relief and colour. We mounted it on a wall in the museum with appropriate low-inclination lighting. We used this acquisition as leverage to obtain funding for a precise 3-dimensional reconstruction of one square meter (after retrodeformation) of the Mistaken Point sea floor. This reconstruction is set moments before the arrival of the volcanic ash that ultimately smothered and preserved the

Activities Planned for 2012:

The major Canadian event for 2012 will be the Hans Hofmann Memorial session and fieldtrips on Neoproterozoic paleontology and events, which will take place in conjunction with the Geological Association of Canada in late May – early June 2012. These represent official activities of **IGCP 587, "Identity, Facies and Time, the Ediacaran (Vendian) Puzzle"**, the IUGS/ICS Neoproterozoic Subcommission, and the Paleontology and Precambrian divisions of the Geological Association of Canada.

A keypoint of the meeting will be a special session "**Neoproterozoic to Cambrian Evolution of the Earth and Life: A Session in Memory of Hans J. Hofmann**" organized by Guy Narbonne. This special session will honour the memory of Canada's pre-eminent Precambrian paleontologist, Hans Hofmann (1936-2010), through discussion of the physical, chemical, and especially biological features and events that characterized this critical stage in the evolution of the Earth and life.

A complementary pre-meeting fieldtrip (Thursday May 24th – Saturday May 26th) "**The dawn of the Paleozoic on the Burin Peninsula**" led by Paul Myrow and Guy Narbonne will examine the Ediacaran-Cambrian GSSP and overlying fossiliferous basal Cambrian (Fortunian) strata on the Burin Peninsula of Newfoundland. The sequence include siliciclastic strata with diverse and well-preserved earliest Cambrian trace fossils and carbonate units with "small shelly fossils", that together illustrate the earliest stages of the so-called "Cambrian Explosion". The sections include spectacular examples of storm-generated sandstone beds and mass transport deposits associated with muddy deltaic systems.

A complementary post-meeting trip (Wednesday May 30th – Saturday June 2nd) "**The Mistaken Point biota of Avalon: Ediacaran glaciation, oxidation, and the origin of animals**" led by Guy Narbonne and Richard Thomas. The sedimentary rocks of the Avalon Peninsula record the final Neoproterozoic glaciations, quickly followed by a rapid thaw accompanied by deep-water oxygenation. These massive global changes set the stage for "When Life Got Big" 580 million years ago, the abrupt appearance of large, architecturally complex life forms after nearly 3 billion years of microbial evolution. This excursion traces these events, starting with the glaciogenic Gaskiers Formation, then visiting the numerous fossil surfaces of Mistaken Point that record the earliest stages in complex Ediacaran life and are currently proposed as a UNESCO world heritage site, and ending with the enigmatic fossil *Aspidella* and the final fill of the Avalon Basin.

There are many other Neoproterozoic attractions at this meeting. Kurt Konhauser is organizing a special session on "**Precambrian Geomicrobiology: Ancient Microbial Activity and its Impact on Earth Surface System Evolution**". Day-trips to Mistaken Point and Flat Rock, and longer pre- and post-meeting trips to Bonavista Peninsula are also scheduled in the program. In addition, St. John's is an amazing city to explore, late May-early June is great for spotting whales and icebergs, and 2012 marks the 100th anniversary of the sinking of the Titanic off Newfoundland's shores.