



## \$17M+

### Four countries announce new funds for barcoding

Four countries, including three economic giants of the developing world, have announced funding for new barcoding initiatives. More than US\$17 million has been allocated to projects in Brazil, China, India and Poland.

#### Index:

Funding roundup	2
New iBOL Directors	3
CBD agreement	4
Aussie blitz	5
New centre in India	6
Ebbe Nielsen prize	6
North Sea project	7
iBOL launch	8
Squid riddle	10
New ABS agreement	11
Bike marathon	12



## Why barcode? SSC delegates say iBOL must spell out long-term vision

Delegates to the second meeting of the iBOL Scientific Steering Committee reaffirmed their commitment to the project's barcoding goals but also identified the need to look beyond those targets towards a longer-term vision and mission for iBOL.

There was widespread agreement that the continuing success of the iBOL project will depend on its ability to answer the question "Why barcode?" – shifting the focus to the application of barcoding technology with a vision of harnessing and linking biodiversity for the benefit of humanity and a mission to engage stakeholders, from scientists, administrators and funders to students, amateur taxonomists and the public.

The 120 delegates at the SSC meeting, held in Guelph September 24-25, included representatives from iBOL's 26 member countries (Nodes) and 20 Working Groups as

ABOVE LEFT: Jesse Ausubel, vice-president of programs with the Alfred P. Sloan Foundation and a member of the iBOL Board of Directors, delivers the closing address at the second meeting of the iBOL Scientific Steering Committee.

well as members of the GE<sup>3</sup>LS research team, the iBOL Board of Directors, Science Advisory Board and Technology Development Advisory Group. The meeting was planned as a consultation between the SSC and iBOL's governance and management team with small group discussions designed to help delegates clarify the goals, challenges and strategies for their Working Groups and Nodes.

Among the main outcomes was the decision to create an SSC sub-committee to identify and act on issues that arise between meetings of the full committee. iBOL management will propose the terms of reference and process to establish this body.

*continued on page 9*

## Signing ceremony in Nagoya

Ahmed Djoghlaif (left), Executive Secretary of the Convention on Biological Diversity (CBD) Secretariat, and Christian Burks, Chair of the iBOL Board of Directors, sign a Memorandum of Understanding October 25 during the 10th Conference of Parties to the CBD held in Nagoya, Japan. *Story page 4*



Section of DNA barcode for the giant squid (*Dosidicus gigas*)



## Making every species count

# Funds flow to barcode initiatives

## Brazil: Funding for BR-BoL national barcoding program

Brazil's National Council for the Development of Science and Technology (CNPq) is considering funding proposals for the DNA barcoding projects that will initiate the new National Program for the Molecular Identification of Brazilian Biodiversity, or BR-BoL.

The Ministry of Science and Technology (MCT) has allocated R\$5.4 million (US\$3.25 million) to create a single national network comprising decentralized projects, which may be articulated either by institution or by taxonomic group.

During a presentation to the iBOL side event at CBD COP10 in Nagoya October 20 [see story on page 4], MCT biodiversity coordinator David Oren said that the CNPq had set a November 29 deadline for project proposals.

Oren outlined some other details of the call for proposals, including:

- Individual projects will receive maximum funding of US\$600,000 and must be implemented within three years.
- \$180,000 is set aside for a single, unified information system.
- Selection criteria include geographic distribution, taxonomic coverage and the profile of the project coordinator.
- All reference specimens must be housed in national repositories.

Oren said that the decision to create and fund BR-BoL reflects the conviction that the country needs a strong, articulated national barcoding effort executed in collaboration with iBOL and relevant global campaigns such as FISH-BOL and the All Birds Barcoding Initiative.

"The decision to implement a national barcoding program is perceived as being of critical strategic importance to Brazil," he said. "As such, it is not a Lula government policy or a 'next government' policy. It is Brazil's national policy." ❖

## China: \$2.5M to a wide-ranging initiative



Ya-ping Zhang

DNA barcoding in China received a major boost with the announcement that the National Natural Science Foundation of China has awarded a 10 million CNY (US\$1.5 million) grant to a wide-ranging initiative directed by Prof. Ya-ping Zhang, Director of the Kunming Institute of Zoology (KIZ), Chinese Academy of Sciences (CAS).

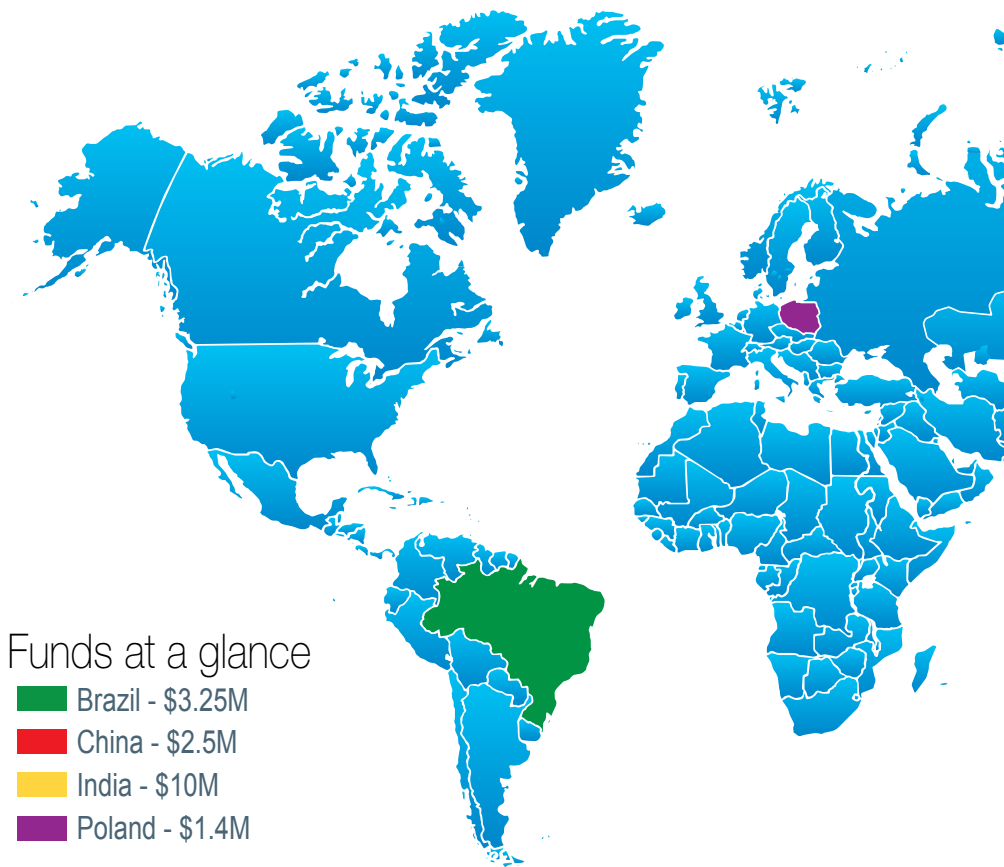
The project has four components:

- A group led by Prof. Zhang will investigate high throughput data acquisition, potentially making use of the institute's two genomic level sequencers. Sanger-based sequencing will also be performed.
- The first major coordinated effort to barcode Asian amphibians and non-avian reptiles will be undertaken. The vast tissue

collections of the Royal Ontario Museum (ROM) will be used to initiate the barcoding of Asian species. These tissues will be augmented by collections from China and Southeast Asia. Already underway, this work will help to identify species and body parts illegally imported into China. The herpetological effort is based at KIZ where the primary researchers are Assoc. Prof. Jing Che, Assoc. Prof. Ding-qi Rao and Prof. Robert Murphy (ROM and University of Toronto), who holds an academic position in the CAS. The Chengdu Institute of Biology, CAS, will contribute to this effort.

- Prof. Shun-ping He will head a team of researchers based at the Institute of Hydrobiology (IH), CAS, in Wuhan, Hubei, in a major effort to barcode Asia's cyprinid fishes. His team will focus on the phylogenetics and biogeography of fishes.

- And Prof. Da-wei Huang will head a team of researchers barcoding insects with an emphasis on parasitic wasps at the Institute of Zoology (IOZ), CAS, in Beijing. Prof. Huang and associates currently have a paper in press in PLoS ONE on NUMTs and Wolbachia infections and their implications



for barcoding fig wasps.

The CAS has also made a significant contribution to the barcoding effort by awarding an additional 6 million CNY (US\$900,000) to support the work being undertaken at KIZ, IH and IOZ. It has also added two other CAS institutes, the Kunming Institute of Botany and the Institute of Microbiology, to the suite of funded institutions. As with the NSFC grant, this effort will be coordinated at KIZ by Prof. Zhang. ❖

## India: \$10M to barcode plants, insects, fishes



S. Ayyappan

Plants, insects and fishes will take priority in a new \$US10 million DNA barcoding initiative announced by the Director General of the Indian Council on Agricultural Research (ICAR), Dr. S. Ayyappan, during an international consultation on DNA

barcoding held November 6-7 in New Delhi.

By year's end, ICAR is looking to give the green light to three or four proposals in each category for a total of up to 12 projects drawing heavily on the expertise of ICAR specialist research institutes such as the Central Institute on Fisheries Education (CIFE) in Mumbai, the National Bureau of Plant Genetic Resources in New Delhi and the National Bureau of Agriculturally Important Insects in Bangalore.

Preparations for an imminent dramatic increase in DNA barcoding activity in India dominated the second day of the recent International Consultation, organized by CIFE Director Dr. Wazir Lakra, India's representative on the iBOL Scientific Steering Committee.

One working session focused on identification of priorities for barcoding projects in India and an examination of models for organizing India's participation as an iBOL Regional Node. Delegates discussed formation of a National Committee to launch and monitor projects, a national network to operate collaborative projects and the establishment of core barcoding facilities to carry out sequencing and provide training. It was agreed that all the new ICAR-funded projects will use Barcode of Life Data Systems to store, organize and analyze their barcode data. ❖

## Poland: \$1.4M for national barcoding factory

Poland's Ministry of Science and Higher Education has approved a €1 million (US\$1.36 million) grant to finish building the country's DNA barcoding factory and metagenomic facility at the Museum and Institute of Zoology of the Polish Academy of Sciences in Warsaw.

The grant will be used to purchase a highly accurate, massively parallel next-generation sequencing platform and other essential equipment. It will also be used to complete the Laboratory Information Management System. The barcode factory is expected to be fully operational in September, 2011.

The increased barcoding capacity will accelerate the institute's existing projects – barcoding nematodes and mammals of the Caucasus Mountains, a global biodiversity hotspot. A new project focused on Coleoptera of Poland is also being considered. ❖

# Two new Directors join Board of iBOL

Two new members have joined the iBOL board of directors, increasing its complement from seven to nine. The new directors are Ivar Myklebust, Director of the Norwegian Biodiversity information Centre, and Rocky Skeef, Executive Director, New Business Development, with South Africa's National Research Foundation (NRF).



Ivar Myklebust trained as a zoologist at the University of Trondheim. He is a member of the Norwegian delegation to the governing board of the Global Biodiversity Information

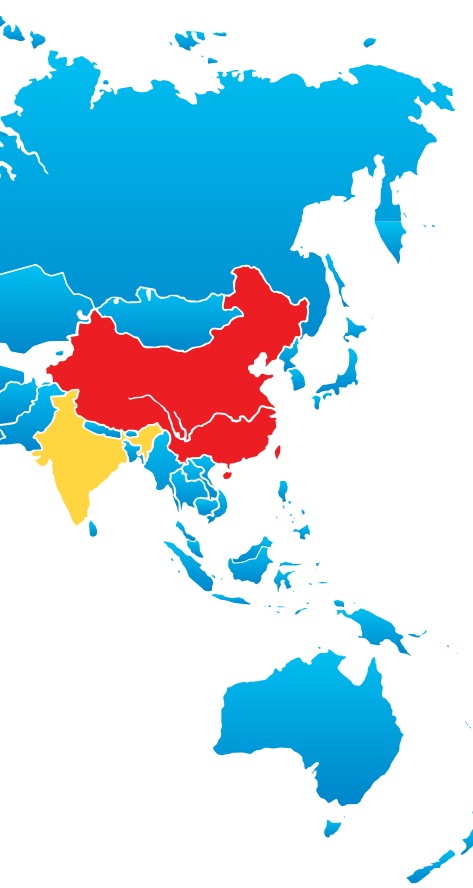
Facility. He has also undertaken a number of other international activities including the Norwegian-Russian commission on environmental protection and various working groups under the Nordic Council of Ministers.



Rocky Skeef completed his PhD in biochemistry at Rhodes University in Grahamstown in 1987 and has worked at the NRF – a statutory body that supports and promotes research through

funding, developing human resources and providing facilities – since 2004. As Executive Director of New Business Development, his primary role is to build the foundation's financial resources.

The iBOL Board approved the appointment of Myklebust and Skeef at its Annual General Meeting, held in Toronto September 26. The new directors will officially take their seats at the board's next meeting, scheduled for April 2011. ❖





# iBOL, CBD pledge to cooperate on 'common goals'

## Memorandum signed at COP10 in Nagoya

A new agreement between iBOL and the Convention on Biological Diversity (CBD) Secretariat commits the two organizations to identify and exploit opportunities for collaboration in areas of mutual interest.

At a ceremony held during the 10th Conference of Parties to the CBD in Nagoya (CBD COP10), iBOL Board Chair Christian Burks and CBD Executive Secretary Ahmed Djoghlaif signed a Memorandum of Understanding that establishes a formal framework of cooperation designed to further common goals.

These include promoting and facilitating capacity building in species identification and discovery, scientific cooperation and technology development to provide the relevant processes of the CBD with biodiversity information and supporting the CBD processes with respect to biodiversity targets, national biodiversity strategies and action plans, monitoring, indicators and assessments, and invasive alien species.

"The International Barcode of Life Project will make important contributions to the overarching goal of the Convention on

Biological Diversity – to stop and reverse the loss of biodiversity," said Dr. Djoghlaif. "iBOL is a unique project with tremendous potential to help countries as they develop and implement their national biodiversity strategies."

The signing ceremony was held during a packed iBOL Side Event at the COP entitled "Making every species count: DNA barcoding and the CBD". The event, which was moderated by CBOL Executive Secretary David Schindel, featured a presentation by Canadian Barcode of Life

Network Associate Director Bob Hanner, who explained the science of barcoding, the structure and goals of Canadian Barcode of Life Network and how they can be applied to the goals of the CBD.

A panel of biodiversity policy leaders from four iBOL member nations – China (Central Node), Australia, Brazil and South Africa (Regional Nodes) – gave brief presentations on the status of DNA barcoding in their respective countries. ❖

Pictured at the iBOL side event at CBD COP10 in Nagoya – Standing (from left): David Schindel, Executive Secretary of CBOL; Christian Burks, Chair, iBOL Board of Directors; Bob Hanner, Associate Director, Canadian Barcode of Life Network; and Ahmed Djoghlaif, Executive Secretary, CBD Secretariat. Seated (from left) Joanne Daly, Strategic Advisor, Science, Strategy and People, CSIRO, Australia; David Oren, Biodiversity Coordinator, Brazilian Ministry of Science and Technology; Keping Ma, Deputy Director, Biodiversity Committee, Chinese Academy of Sciences; and Tanya Abrahamse, CEO, South African National Biodiversity Institute (SANBI).



# Barcoding blitz targets Australian Lepidoptera



because of its large, well-curated collection assembled by staff over the past half century.

The tissue samples were placed in 96-well microplates and transferred to BIO for sequencing, which will be completed by 2011. Although many of the specimens are more than 20 years old, at least 80 percent are expected to produce barcode records, setting the stage for their subsequent use in species identification. These sequence records will also aid the resolution of taxonomic uncertainties and reveal overlooked species whose status can subsequently be confirmed by more detailed morphological and genetic analyses.

The main goal of the ANIC "barcode blitz" was to demonstrate that a comprehensive, authoritative DNA barcode library can be assembled quickly by making good use of specimens held in well-curated collections.

During future visits, BIO researchers will complete a barcode reference library for all Australian Lepidoptera and start work on other insect groups. It is also hoped that the work at ANIC will inspire other major museums to initiate similar analytical programs. ❖

Group photo at the ANIC barcoding blitz: (standing, from left) ANIC collections technician Youning Su, ANIC Director John LaSalle, Division of Entomology chief Mark Lonsdale, BIO team leader Rodolphe Rougerie and BIO photographer Jaclyn McCormick; (front, from left) BIO sampling technicians Jayme Sones, Stephanie Kirk and Christy Carr and ANIC collections manager Beth Mantle.

A team of five researchers from the Biodiversity Institute of Ontario (BIO) in Guelph, sampled 12,000 specimens representing about 4,000 species in a four-week "barcode blitz" of Lepidoptera at the Australian National Insect Collection in Canberra. The species total represents one third of described Australian Lepidoptera.

Led by Paul Hebert and Rodolphe Rougerie, the team executed a sampling protocol that consisted of databasing, collection and taxonomic information, photographing and removing a single leg from each specimen (even microlepidoptera) for DNA barcode analysis before returning it to its original drawer.

A yellow barcode label was added during the process, providing the reference sample ID needed to link each specimen to its DNA barcode that will be stored in the publicly accessible Barcode of Life Data Systems (BOLD) database.

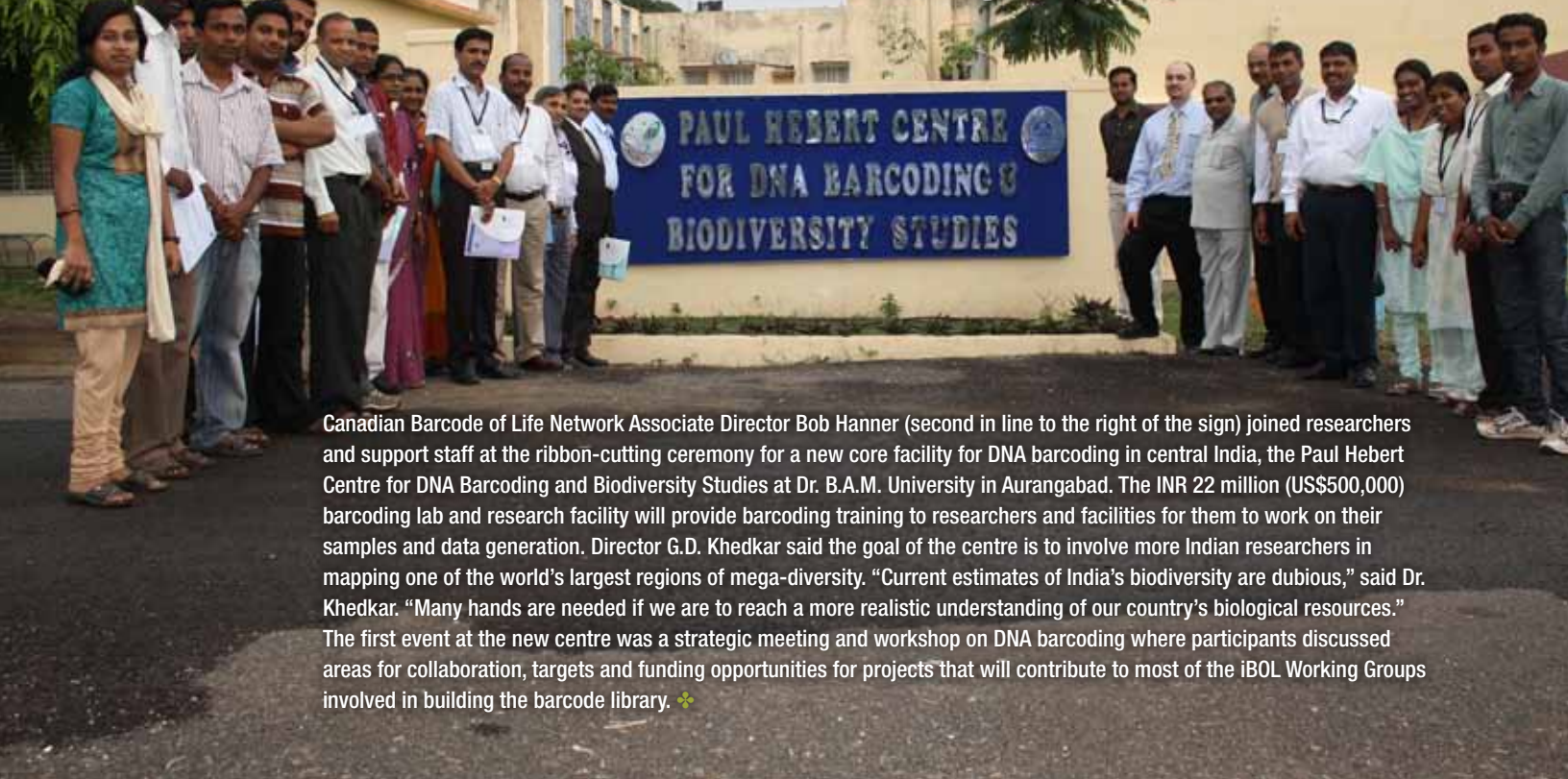
This research effort, the result of a formal collaboration between ANIC and BIO, represents an important contribution to one of the key goals of the International Barcode of Life Project— assembling barcode records for 80,000 species of Lepidoptera by 2015. ANIC provided a superb setting to advance the construction of a DNA barcode reference library for Australian Lepidoptera

Stephanie Kirk divests a moth of its leg during the ANIC barcode blitz.





# New barcoding centre opens in Aurangabad



Canadian Barcode of Life Network Associate Director Bob Hanner (second in line to the right of the sign) joined researchers and support staff at the ribbon-cutting ceremony for a new core facility for DNA barcoding in central India, the Paul Hebert Centre for DNA Barcoding and Biodiversity Studies at Dr. B.A.M. University in Aurangabad. The INR 22 million (US\$500,000) barcoding lab and research facility will provide barcoding training to researchers and facilities for them to work on their samples and data generation. Director G.D. Khedkar said the goal of the centre is to involve more Indian researchers in mapping one of the world's largest regions of mega-diversity. "Current estimates of India's biodiversity are dubious," said Dr. Khedkar. "Many hands are needed if we are to reach a more realistic understanding of our country's biological resources." The first event at the new centre was a strategic meeting and workshop on DNA barcoding where participants discussed areas for collaboration, targets and funding opportunities for projects that will contribute to most of the iBOL Working Groups involved in building the barcode library. ❖

## BOLD architect honoured at GBIF event

**B**arcode of Life Data Systems (BOLD) architect Sujeewan Ratnasingham (right) received the Ebbe Nielsen Prize from Korean Minister of Education Science and Technology, Dr. Ju-Ho Lee, during the Global Biodiversity Information Facility's annual governing board meeting in Suwon, Korea.

Ratnasingham received the award for his groundbreaking work on BOLD, the online workbench for collecting, storing, managing, analyzing and using DNA barcodes for species identification and discovery. He plans to use the €30,000 prize to bolster outreach and network building projects that will expand the user base of BOLD to include researchers from the broader biodiversity science community.

En route to the award ceremony, Ratnasingham paid homage to the late Ebbe Nielsen by visiting the Australian National Insect Collection (ANIC) in Canberra, where Nielsen was appointed director in 1990 and where colleagues from the Biodiversity Institute of Ontario were conducting a "barcode blitz" of Australian Lepidoptera. (See story page 5) ❖





# Barcoding the North Sea's 'neglected' biodiversity

Climate change and massive habitat destruction make the reliable identification of marine species a pivotal component of biodiversity studies and conservation planning. However, most marine biodiversity studies are conducted in highly diverse hotspots like the coral reefs or the nearly unexplored deep sea. In contrast, the biodiversity of “well-studied” habitats such as the North Sea is almost neglected.

Molecular Taxonomy of Marine Organisms, a new research group of the German Centre of Marine Biodiversity Research (DZMB, Wilhelmshaven), aims to change all that. Funded by the Federal Ministry of Education and Research (BMBF) and the Land Niedersachsen, the group's mission is to test and develop molecular methods for the identification of the marine metazoan fauna of the North Sea, aiding efforts to monitor biodiversity patterns and seasonal changes.

The research will focus on the analysis and identification of specimens using DNA barcodes as well as supplementary nuclear markers. DNA samples and specimen vouchers will be stored long-term and



managed by a self-governing database. Environmental samples, particularly

zooplankton, will be analysed with special emphasis on meroplankton larvae which are difficult to identify to a species-level based on morphological characters.

For these community studies, total genomic DNA extracts will be analysed using “next generation” sequencing methods, generating a large sequence database for subsequent comparative studies. The project will also develop molecular methods for the rapid identification of eggs and larvae of selected commercially important invertebrate and vertebrate species, including various fish species.

The project welcomes expressions of interest from other researchers or institutes. Contact: Michael Raupach, [mraupach@senckenberg.de](mailto:mraupach@senckenberg.de) ❖



ABOVE: Neglected biodiversity – a benthos sample of the North Sea

LEFT: On board the research trawler Senckenberg, researchers sort specimens for further molecular studies.

# Our name in lights!

## iBOL launch celebrated in “barcoded” CN Tower

A giant DNA barcode of a North American beaver lit up the sky over downtown Toronto September 25 to mark the official inauguration of the International Barcode of Life Project.

The barcode sequence of *Castor canadensis* was projected onto the world famous CN Tower while, in the tower’s 113-story-high revolving restaurant, iBOL collaborators from every region of the world joined business and government leaders at a reception and dinner to celebrate the launch of the world’s largest biodiversity genomics initiative.

The guest of honour was Ontario’s Minister for Research and Innovation, Glen Murray, who hailed the iBOL project as a powerful catalyst for positive change because of its global scope and its commitment to making barcoding data and research results freely accessible to everyone.

“We [the government of Ontario] are big believers in open source,” Murray said. “because the challenges we face today are so overwhelming that if we do not share our generosity, our wealth and our ideas openly – if scientists can’t be scientists before they are nationals of their countries, if we can’t care about children in Rwanda as much as we care about children who live next door to us – then we have failed to be the kind of human beings that our knowledge and our science, our aspirations and

our faiths demand of us.”

iBOL Board of Directors chair Christian Burks welcomed guests to the event and Ahmed Djoghla, Executive Secretary of the Convention on Biological Diversity Secretariat, delivered a message of congratulations via video.

University of Guelph president Alastair Summerlee, spoke of the critical task being undertaken by members of the iBOL partnership in “literally transforming the way we think about biodiversity. There can be nothing more important than that,” he said.

iBOL Scientific Director Paul Hebert injected yet another celebratory note into the proceedings when he announced that Barcode of Life Data Systems (BOLD) had officially registered its one millionth barcode record that afternoon. ❖



ABOVE: Pictured at the iBOL launch (from left) are iBOL Board of Directors chair Christian Burks, University of Guelph President Alastair Summerlee, iBOL Scientific Director Paul Hebert and Ontario’s Minister of Research and Innovation Glen Murray.



LEFT: In his speech, Glen Murray praised iBOL for its commitment to the “open source” model of sharing data and ideas.





# And so it begins...

The old Zoology Annex 1 at the University of Guelph is reduced to rubble to make way for the new \$18 million Centre for Biodiversity Genomics. Construction of the new facility, which will adjoin the Biodiversity Institute of Ontario (seen at left), is expected to take about 15 months. The CBG will be the scientific and administrative hub for iBOL.



... continued from page 1

Many delegates emphasized the need for flexibility in defining and empowering the iBOL Nodes and linking their efforts across Working Groups. A matrix of Nodes and Working Groups was proposed with Nodes representing capacity (institutions, funding, facilities and human resources) and Working Groups representing competencies (taxonomic focus areas, research activity and administration). The proposed matrix will allow Nodes to scan across Working Groups to ensure that resources are being applied to work that corresponds with their interests.

During discussions about iBOL Nodes, delegates noted the clear differences between the different levels of Node participation:

- National Nodes are “ground up” entities emerging through activities driven by individuals, groups or institutions that provide a focal point for barcoding in that country. The transition from focal point to National Node comes about through the formal coordination of participants.

- Regional Nodes, with their capacity to expand partnerships, establish a funding base and develop infrastructure on a regional basis, should act as “mirror” of

iBOL, proactively helping to achieve the aims of the project in the context of their regional priorities.

- Central Node status indicates the capacity to establish large core facilities to barcode specimens from diverse sources and geographies and to take the lead in knowledge and technology transfer across other Nodes in the iBOL partnership. These discussions highlighted the fact that the Central Nodes – Canada, China, European Union and USA – are at different stages in their development. It is important not to skip the steps necessary to establish national and/or regional node structures and support, en route to fulfilling the much broader mandate of Central Nodes.

The discussion sessions dealing with the iBOL Working Groups also highlighted the widely differing challenges facing the biologists, genomicists, informaticians and other experts tasked with ensuring that iBOL meets its ambitious Phase 1 targets.

Participants in the Theme 1 session (for Working Groups involved in building the Barcode Library) were mostly optimistic about achieving their iBOL barcoding targets. The main concerns were access to collections and specimens and compliance

with national regulations and iBOL policies.

Participants in Themes 2, 3 and 4 (Methods, Informatics and Applications) – members of cross-cutting working groups with milestones and deliverables defined by the work of Theme 1 – identified the need for frequent “cross-talk” to help adjust goals, and for user groups that will validate and refocus efforts.

The Theme 5 (Administration, Outreach and Collaboration) group focused on the need to define iBOL’s purpose, vision and global perspectives and to build strategies, processes, metrics, templates and reporting structures around its mission.

In a separate plenary session, David Castle, head of iBOL’s GE<sup>3</sup>LS (Genomics and its Ethical, Economic, Environmental, Legal and Social Aspects) research team, presented the GE<sup>3</sup>LS research plan and stressed the need to integrate GE<sup>3</sup>LS into the project’s science and technology Working Groups. He also returned to the “why barcode?” question, urging SSC members to think about the socio-economic benefits above and beyond the scientific and technological aspects of barcoding. ❖



# Barcodes help solve riddle of the stranded squid

By John James Wilson

When Heather Braid heard the news report about a mass stranding of giant Humboldt squid on Vancouver Island off the west coast of Canada, she realized that it was the opportunity she had been waiting for.

Heather, an undergraduate research assistant in Bob Hanner's lab at the University of Guelph, wanted to study squid for her thesis project but had been thwarted by the fact that specimens are typically preserved in formaldehyde, rendering them unsuitable for DNA analysis. Now fate had served up lots of freshly dead squid with good DNA ready for the taking.

Having recently volunteered with Beth Clare extracting DNA from bat guano [Barcode Bulletin Vol.1 No.2 - June 2010], Heather speculated that barcoding stomach contents to find out what the squid had been eating could explain their apparent mass suicide. She contacted Josie Osborne, marine biologist and Executive Director of the Raincoast Education Society, who had been interviewed



All washed up: one of the stranded squid on the beach at Tofino, British Columbia.

by journalists reporting on the stranding. Josie agreed to fill her freezer with squid stomachs to protect the DNA until Heather could collect them. After a quick 8,000km trip to Tofino and back, 20 stomachs were in the lab in Guelph ready for analysis.

Heather's technique, picking out bone and tissue fragments from the sludgy stomach contents, worked well. It revealed that the squid had been eating sardines and herring, both implicated in mass strandings of other marine animals because they are vectors of paralytic shellfish toxin, which causes nervous system damage.

Collaborating scientists Jon Deeds and Stacey DeGrasse at the US Food and Drug Administration Center for Food Safety and Applied Nutrition confirmed the presence of toxin in the stomach contents. Now Heather wanted to find out if the toxin was finding its way into the animals' tissue. The squid bodies were long gone, however – eaten by bears and other scavengers – and any tissue that did remain would be unsuitable for testing. It seemed the opportunity to resolve the squid stranding mystery had been lost.

But then it happened again. "Squid wash ashore again in Tofino" said the headline. Heather quickly emailed Josie and asked her to collect more stomachs and, this time, whole squid as well. Josie obliged and three complete squid were deposited in her freezer. All that remained was the task of transporting three two-metre-long creatures across the country to the lab in Guelph.

After a five-day train journey from Toronto to Vancouver, a ferry to Vancouver Island and a car journey to the western beaches of Tofino, the Guelph team finally had three squid ready for the trip back to Guelph. The first leg was trouble-free: bus, ferry and an overnight stay for the squid in the deep freeze at Takis' Taverna in downtown Vancouver (squid was

on the menu, just not Humboldt squid). At the train station in Vancouver, however, the squid were denied permission to board because they were stored in Styrofoam coolers. "What if they die during the journey?" asked the train manager.

"They're already dead," he was told. It didn't matter. No squid was going anywhere until an enormous plastic cooler and extra dry ice was purchased. Five days later, they were safely in a lab's freezer in Guelph.

Jon and Stacey requested the stomach contents, mantle tissue, digestive glands and gonads, which made for interesting thawings and dissections in the lab at the University of Guelph science complex.



Researchers had to act quickly to lodge their squid order before this individual arrived to lunch.

Subsequent testing revealed high levels of toxin in all tissues, supporting the hypothesis that the squid became disoriented and ended up stranded on the beach after eating contaminated sardines and herring (established by DNA barcoding).

These results have been submitted to the journal *Marine Biology* in what is believed to be the first report of paralytic shellfish toxin in jumbo (Humboldt) squid and the first use of DNA barcoding to analyze squid stomach contents. The findings have implications for human consumers and other predators that routinely feed on jumbo squid who may unwittingly be accumulating paralytic shellfish toxin in their own tissues. ❖

*John James Wilson is a recent PhD graduate from the University of Guelph*



In the University of Guelph lab, John James Wilson dissects a giant squid.

Solution to Word Scramble (BB Vol.1, No. 3)

The scrambled words were:

ANNELIDA	PLATYHELMINTHES
ASCOMYCOTA	MAGNOLIOPHYTA
CNIDARIA	

And the answer to the riddle

(Why do DNA barcoders walk funny?) is:

SMALL GENES



# New ABS agreement is good news for barcode community

By David Schindel

**D**NA barcoding is a global enterprise, not just because there are participants in all regions of the world, but also because most barcoding projects rely on international partnerships for taxonomic expertise and technical support for lab procedures and informatics.

Cross-border movement of specimens, tissue samples, DNA extracts and PCR products is essential for the success of barcoding. An international agreement reached in Japan in October has raised hopes that it will soon be easier for researchers involved in barcoding and other non-commercial research to move samples around the world.

The Convention on Biological Diversity (CBD) entered into force in late 1993 and now has 193 “parties” – countries that have signed and ratified the treaty. Before 1993, species were considered part of global patrimony, but the CBD shifted the research landscape by asserting that each country has sovereign control over access to the biological diversity in its territory.

Some countries, especially biodiverse developing countries in the tropics, passed laws that severely restrict access to and use of biological specimens by foreign researchers, based on the belief that many tropical species have natural products that could be made into valuable pharmaceuticals, agricultural products, cosmetics and other commercial products. Foreign researchers were suspected of “biopiracy” and there was little or no distinction between non-commercial academic research (like taxonomy) and commercial bioprospecting.

One of the CBD’s main goals is to empower countries to control access to their genetic resources so that they can reap the benefits of their use in fair and equitable

ways. Developing and industrialized countries have discussed an International Regime for Access and Benefit Sharing (IR-ABS) at more than a dozen international negotiations since 2004.

Progress was slow, however, and as recently as September, 2010 many critical issues remained unresolved. The relationship between the IR-ABS and other UN treaties that involve biological materials (e.g. Law of the Seas, the Antarctic Treaty, CITES) was not clear. Furthermore, some countries wanted to include valuable pathogens under the IR-ABS but the World Health Organization promotes international sharing of samples to combat pandemics. The question of whether to include “derivatives” – synthesized biochemical compounds modeled after natural products – was another major controversy since these would include enzymes and other active compounds, as well as PCR products.

Participants at barcoding meetings have repeatedly sought the help of the Consortium for the Barcode of Life (CBOL) in explaining to their governments why barcoding isn’t biopiracy. CBOL, iBOL and six other co-sponsors held a five-day ABS workshop in Bonn in November 2008 with the goal of developing a strategy for non-commercial research (<http://barcoding.si.edu/ABSworkshop.html>). iBOL and Canada’s International Research Development Centre (IDRC) organized and sponsored an ABS workshop at the Mexico City Barcode of Life Conference in November 2009 and a subsequent Community Page in *PLoS Biology*. Since that time, both CBOL and iBOL have been promoting simplified access procedures for non-commercial research with special emphasis on the many non-monetary benefits arising from non-commercial

research, barcoding being a prime example.

The payoff came in the closing minutes of the CBD’s biennial Conference of the Parties in Nagoya, Japan, in October when countries reached agreement on an IR-ABS incorporating the text on non-commercial research that CBOL, iBOL and other research organizations have been promoting:

## ARTICLE 6 SPECIAL CONSIDERATIONS

In the development and implementation of its access and benefit-sharing legislation or regulatory requirements, each Party shall:

- (a) Create conditions to promote and encourage research which contributes to the conservation and sustainable use of biological diversity, particularly in developing countries, including through simplified measures on access for non-commercial research purposes, taking into account the need to address a change of intent for such research.

CBD will now create a working group to negotiate an implementation plan for the IR-ABS and countries will start thinking about the ratification process. The critical issue for barcoders is how countries will design their national legislation and regulations based on the new IR-ABS. iBOL and CBOL are forming a joint ABS Committee to develop standard ABS agreements that barcoding projects can use as a starting point to negotiate access for particular projects.

The barcoding community played an important role in representing non-commercial research to the ABS negotiators. iBOL and CBOL will continue to play a leadership role. If you would like to contribute to this initiative, contact Greg Singer, iBOL’s representative on the joint ABS committee, at [gsinger@iBOL.org](mailto:gsinger@iBOL.org) ❖

*David Schindel is Executive Secretary of CBOL.*

# Team Prasmodon flies the barcode banner at 'the toughest 48 hours in sport'

**T**eam Prasmodon, jerseys emblazoned with the iBOL logo and the iBOL-barcoded *Prasmodon eminens* namesake of a tropical parasitic wasp species, pedalled to an impressive finish in the 36th edition of the Furnace Creek 508 Bicycle Race in October.

Proudly displaying the emblems of Costa Rica's Guanacaste Dry Forest Conservation Fund (GDFCF) and Guanacaste Conservation Area, which they enthusiastically support, John McAllister, Jeff Davis, Bradley Zlotnick and Barcode of Life artist Joseph Rossano (Barcode Bulletin Vol. 1, No. 1, March 2010) finished 22nd among 120 solo and team entries in the race known as "The Toughest 48 Hours in Sport" ([www.the508.com](http://www.the508.com)). Their time of 34 hours 39 minutes 4 seconds was within a few minutes (exactly the 15-minute penalty for missing a stop sign in the middle of the Mohave desert, in fact) of second place in their highly competitive 40-plus four-man team division.



Zlotnick, a San Diego emergency physician, recruited Team Prasmodon to support GDFCF's path-breaking Parataxonomist endowment programs. Dr. Daniel Janzen leads the parataxonomists, among the first and still the most prolific specimen contributors to iBOL.

A Janzen student for over 20 years, Zlotnick engaged Seattle artist and cyclist Rossano last year to create a DNA barcoding art exhibition in collaboration with Janzen and the Ontario Genomics Institute. McAllister is Rossano's former LSU cycling teammate and Davis is a San Diego educator and four-time veteran of the 508.

The non-stop 508-mile race is known throughout the cycling fraternity for its epic mountain climbs, stark desert scenery, desolate roads and a reputation as one of the toughest but most gratifying endurance challenges available.

Team Prasmodon coordinated invitations with Janzen's public lecture and Parataxonomist Endowment dinner with Harvard ecologist E.O. Wilson in Cambridge, MA the evening before the California race. With the help of the recently announced World Bank one-for-one match for Costa Rica parataxonomist barcoding efforts, the two events raised over \$200,000 for GDFCF, funds that will support ongoing iBOL specimen collection and ecological study.

Feeling great after 508 miles, Team Prasmodon is (from left): Jeff Davis, John McAllister, Brad Zlotnick and Joe Rossano.

Barcode Bulletin readers who are interested in supporting a GDFCF parataxonomists barcoding endowment and obtaining a Team Prasmodon cycling jersey can contact Brad Zlotnick by emailing [bulletin@iBOL.org](mailto:bulletin@iBOL.org).

Team Prasmodon also submitted their entry to the 508's "Green Team" program that supports environmental efforts. In addition to iBOL, other Prasmodon sponsors include Google Labs; Fusion Tables; Ontario Genomics Institute; Profisee.com; StationFilms.com; JosephRossano.com; SDJA.com; ecomagic.org; Kyoto Prize Symposium; Stanford Medical Center Alumni Association; Sharp Triathlon Team; Vermarc USA; and RiverCity Screenprinting Inc.



Team Prasmodon jersey features Area Conservación Guanacaste, GDFCF and iBOL logos.



Joe Rossano around the 440-mile mark, powering straight through the Mohave reserve with the temperature at 100 degrees F (38 C).

The Barcode Bulletin is published quarterly by the International Barcode of Life project (iBOL).

Material may be reproduced with attribution to the International Barcode of Life.

Designed in partnership with JnD Marketing.

International Barcode of Life Secretariat,  
Biodiversity Institute of Ontario, University of Guelph,  
20 Stone Road East, Guelph, ON, Canada N1G 2W1  
Tel: 1-519-780-5483 Fax: 1-519-824-5703  
[www.ibol.org](http://www.ibol.org)

This newsletter has been printed on  
100% recycled paper

