

Report on the one-day national workshop on barcoding of marine life at Goa, India on 1 December 2008

Introduction

DNA barcoding is an important tool for unequivocal determination of the taxonomic status of a species. Beyond this immediate application there are others, like application in palaeo-biology and evolution, wildlife conservation, census of life of earth, monitoring health and remediation of the environment, checking food purity, evaluating industrial biofouling and so on. Barcoding of life is in fact a young phenomenon (the concept was first put forward in 2003) but is developing fast, with a target of 500,000 species to be barcoded globally within five years by the International Barcode of Life (iBOL) project, for example.

The Census of Marine Life (CoML) has recognized the value of barcoding of life and has begun to encourage this application to complement its census efforts across regions and nations. Supporting this, the Indian Ocean – Census of Marine Life (IO-CoML) organized the first-ever hands-on training on barcoding marine life at the National Bureau of Fish Genetic Resources at Lucknow (India) in April 2007 and got 25 scientists working in the Indian Ocean trained in the techniques of barcoding process.

Following that, the CoML sponsored the establishment of a network of marine barcoders and has enabled uploading of barcodes for about 150 marine species so far.

Recognizing that an impetus at this stage will help an advancement of Barcode of Marine Life in India and also enable funding agencies to look at this with renewed interest, IO-CoML organized an one-day workshop at Goa on 1 December 2008. The invitees comprised of key resource persons from the International Barcode of Life (iBOL) initiative, scientists actively involved in barcoding of marine life and representatives from 3 major governmental funding agencies in India.

Organization of the workshop

The forenoon session was assigned to presentations by iBOL representatives and Indian scientists. A 4-h long brainstorming was the hallmark of the afternoon session.

Presentations made

Paul Hebert : International barcode of life – a digital identification system for eukaryotes

Robert Hanner : Barcode, FISHBOL and the Canadian national network

Christian Burks : International consortium initiatives for developing genomics resources

Shanta Nair : Barcoding of shrimps and chaetognaths

Ajmal Khan : Marine barcoding network in India

Shiburaj : An overview of DNA barcoding centre

Baban Ingole : barcoding of marine polychaetes

Topics suggested for brainstorming

1. Perception levels – how to reach out? To funding agencies, others, national, regional, international....
2. Technical difficulties, methodological issues, outsourcing practices for sequencing
3. Networking. How to strengthen? sharing of resources, avoiding duplication of efforts
4. Progressing from national through regional to global scales
5. Diversify - where to and how?
6. Ex situ gene conservation. Issues in techniques and infrastructure, manpower, repositories
7. Is there a need for an Indian website? Or a list-server?
8. Economic application, larval studies, conservation, trade in protected species....
9. Environmental monitoring, bio-management
10. Classical taxonomy? What do we do for that?
11. Can DNA barcoding be applied to formalin-preserved species?
12. Capacity building – what vision do we have?

Topics taken up for discussion

- Perception levels – how to reach out? To funding agencies, others, national, regional, international....
- Networking. How to strengthen? sharing of resources, avoiding duplication of efforts
- *Ex situ* gene conservation. Issues in techniques and infrastructure, manpower, repositories
- Is there a need for an Indian website? Or a list-server

First round of recommendations

1. Take up on the offer from Ministry of Earth Sciences and form working groups and/or another round of brainstorming with more focused teams in order to develop proposal(s).
2. Develop proposals/ assist in developing proposals with right type of 'appeals' to funding agencies.
3. Prioritize areas of work/ groups to be dealt with in barcoding.
4. Establish a website and list server for marine barcoding in India.
5. Explore possibilities of *ex situ* gene conservation for marine organisms.
6. Get Zoological Survey of India and Botanical Survey of India, Fisheries Survey of India, MPEDA interested and involved.
7. NIO, IO-CoML and GEER to work with MoEF.
8. Get a Status paper of barcoding in India prepared for circulation to interested funding agencies.

Final set of recommendations and actions suggested

1. Creation of interest and fund raising

Actions suggested:

IO-CoML and the National Institute of Oceanography (NIO) to take up on the offer from Ministry of Earth Sciences and form working groups and/or another round of brainstorming with more focused teams in order to develop proposal(s).

GEER (Gujarat Ecological and Environmental Research) Foundation, NIO and IO-CoML, to work with the Ministry of Environment and Forests and organize a workshop of interested groups to develop a joint proposal for funding.

Preparation of a Status paper of barcoding in India (or a document of similar scope) for circulation to potential funding agencies.

iBOL will be pleased to invite India to join the iBOL consortium if the terms of being a member of the consortium are agreeable to the scientists and science funders in India.

2. Targeted approaches

Actions suggested:

Zoological Survey of India and Botanical Survey of India, Fisheries Survey of India, Marine Products Export Development Agency (MPEDA) to be approached

for funding for barcoding of organisms of their interest. For example, the MPEDA will be interested in generating barcodes of all marine organisms and their products exported abroad.

3. Prioritization

Actions suggested:

The working groups as identified/formed under action point 1 above to be encouraged to prioritize biotopes and/or taxa for immediate action and those for staggered action, as a function of importance, technical support and funding opportunities.

4. Strengthen the network

Action suggested:

A debate (preferably by email) to be initiated on the structure of the network of barcoders, especially on the merits of a virtual network against establishment of a core laboratory.

5. Enhancing visibility and communication between marine barcoders

Action suggested:

Establish and maintain a website and discussion forum

List of participants

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