At the heart of the coral triangle in West Papua: an Indonesian-French scientific exploration of a white area with closed-circuit rebreathers (eCCR): [poster]
Régis Hocdé, Jean-Louis Menou, Laurent Pouyaud, Amir Machmud Suruwaky, Indra Bayu Vimono

To cite this version:

HAL Id: ird-01512559
https://hal.ird.fr/ird-01512559
Submitted on 24 Apr 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
At the heart of the coral triangle in West Papua: an indonesian-french scientific exploration of a white area with closed-circuit rebreathers (eCCR)

Regis Hoccleve1, Jean-Louis Menu2, Laurent Pouyaud3, Amir Machmud Suruwaky4, Indra Bayu Vimomo5

Contact: regis.hoccleve@ird.fr

The Bird's Head isthmus connecting the Bird's Head Peninsula with the rest of New Guinea is one of the last pristine areas remaining in Southeast Asia. Dominantly covered by limestones karsts, this vast region of West Papua (Indonesia) is still a terra incognita. At the heart of the coral triangle, the Kumaga and Lengguru limestone karsts and reef slopes are today a major biodiversity reservoir with high levels of endemism.

The French-Indonesian 'Lengguru 2014' expedition was headed by IRD and P2O-LIPI, RCB-LIPI and POLTEK. Exploration and sampling effort were concentrated on several reef slopes of (~100 m to 60 m depth) in West Papua (Indonesia) during 6 weeks.

**MATERIALS, METHODS AND ACTION STRATEGY**

**Rotation within the team to monitor and rescue on surface:**
- Diving team of 2 or 3 eCCR divers, with mutualisation of the Tx5/75 / bailouts Nx75 Triox40/30 Tx20/50 or Deeper Tx)
- (eCCR) : Vision or XPD Inspiration from APDIVING
- Include bonding of rebreathers (both divers)
- Embedded satellite personal locator beacons for diver, life and security equipments, communication equipments including many bailouts: carbon 6.8 Liters 300 bars, 11 liters S80 many spare equipments and consumables
- 1 rebreather for spare and training of indonesian scientists,
- 350 kg of soda lime

**The 30m length vessel of POLTEK «Airaha2»**

**Different objectives:**
- Team of scientific divers including 5 eCCR and 8 open-circuit divers
- AIMS - To perform dives to secure (safety lines).
- Exploration of the area up to 100 meters possible...AND SCIENTIFIC BENEFITS
- Use of rebreather in sciences exploration constitutes a new technological paradigm.

**RESULTS & OUPUTS**

- Significant increase of the autonomy / Gas economy / Increased reserve constant oxygen pressure => Optimization of decompression
- Limitation of thermal losses (breathing of hot, humid air) => Decreased risk of decompression accident, no risk of heating in cold water diving
- Use of rebreather offers together scientific benefits and enhanced diving safety...

**ADVANTAGES : ENHANCED DIVING SAFETY**

- Increased autonomy => Stress reduction in caving
- No recompression dives to secure (safety lines).
- Increased risk of collapse of the vault
- Increased autonomy => Stress reduction in caving
- Use of rebreather offers together scientific benefits and enhanced diving safety...

**PRINCIPLE OF THE CLOSED CIRCUIT REBREATHER (CCR)**

A breathing loop to re-breathe the same gas

**Elimination of CO2 produced**

**Use of air or gas mixtures**

- Different kinds : pur oxygen rebreather, closed-circuit rebreather (CCR), semi-closed/circuit rebreather (SCCR), mechanical rebreathers, and many CE certified models. Consensus for multi-gas electronic closed-circuit rebreather (eCCR)

**CAVE DIVING**

- Increased autonomy => Stress reduction in caving
- No recompression dives to secure (safety lines).
- Increased risk of collapse of the vault
- Increased autonomous breathing of hot, humid air (source : Bishop Museum, R.L. Pyle)

**REFERENCES**


