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L'EXPLORATION ET LA  
CONSERVATION DE LA NATURE

LEOPOLD III-FONDS  
VOOR  
NATUURONDERZOEK  
EN NATUURBEHOUD

L III

ACTIVITES DE L'EXERCICE 1995

ACTIVITEITEN TIJDENS HET DIENSTJAAR 1995

Siège:  
Institut royal des Sciences  
naturelles de Belgique  
Rue Vautier 29 - 1000 Bruxelles  
Tél.: 02/627 42 11  
Fax: 02/646 44 33

Zetel:  
Koninklijk Belgisch Instituut  
voor Natuurwetenschappen  
Vautierstraat 29 - 1000 Brussel  
Tel.: 02/627 42 11  
Fax: 02/646 44 33

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## 1. Subsidies pour recherches à l'étranger Toelagen voor onderzoekingen in het buitenland

Au cours de l'exercice 1995, le Fonds Léopold III a subsidié sept chercheurs et une équipe ouzbege dont les rapports succincts sont repris ci-dessous.

In de loop van het dienstjaar 1995 heeft het Leopold III-Fonds aan zeven onderzoekers en aan een Oezbeekse ploeg toelagen verstrekt. Hierna volgen hun beknopte verslagen.

### 1.1. Dr. E. VERHEYEN, Dr. K. MARTENS (K.B.I.N.) Dr. J. SNOEKS (K.M.M.A.)

*Een expeditie naar het zuidelijke gedeelte van het Tanganyikameer (Zambia & Tanzania).*

28 maart - 30 april 1995.

#### 1. Samenvatting

In het kader van een aantal aan gang zijnde onderzoeksprogramma's over de oude meren werd een zending uitgevoerd om de fauna's van de Zambiaanse en Tanzaniaanse kusten van het Tanganyikameer te bemonsteren. Concreet werd deze bemonstering uitgevoerd met het oog op de verdere uitwerking van lopend taxonomisch, fylogenetisch en populatiegenetisch onderzoek op cichliden, gastropoden en ostracoden.

Gedurende deze 21 dagen durende expeditie werden bij benadering 79 soorten verzameld over een kustlengte van ruim 350 km en 29 localiteiten bemonsterd voor het onderzoeks-programma met betrekking tot de taxonomie, fylogenie en fylogeografie van rotsbewonende cichliden.

Voor de onderzoeksprogramma's met betrekking tot de ostracoden werden -vooral met het oog op taxonomisch onderzoek- 82 stalen verzameld, voor de gastropoden circa 50 stalen.

#### 2. Objectieven

Om de taxonomie en de verspreiding van de cichliden, gastropoden en ostracoden ('modelgroepen') in het Tanganyikameer te bestuderen, werd een gedetailleerde bemonstering uitgevoerd, die de reeds beschikbare verzamelingen complementeert.

Gebruik makend van de PCR en mtDNA sequentietechnieken die wij op punt stelden voor de studie van in ethanol gefixeerde vissen, wordt de genetische differentiatie tussen zowel allopatrisch als sympatrisch voorkomende en nauw verwante cichliden- en gastropodentaxa bestudeerd. Deze informatie zal ons in staat stellen een aantal taxonomische problemen op te lossen. Tevens kan men aldus de snelheid van de soortvorming bij deze taxa schatten, waaruit men kan afleiden in hoeverre bij de bestudeerde taxa de snelheid van soortvorming constant is en of er verbanden kunnen worden gelegd tussen eventuele periodes van 'explosieve' soortvorming enerzijds en geologische episoden of specifieke omgevingscondities (vb. saliniteitsverhoging) tijdens de ontstaansgeschiedenis van het meer anderzijds.

De vangstgegevens worden gebruikt voor de studie van de verspreidingspatronen van een aantal taxa (Lamprologini, Eretmodini, de genera *Ophthalmotilapia* en *Tropheus*).

Van deze groepen wordt de alfa-taxonomie via morphologisch onderzoek bestudeerd.

De autecologische gegevens van de geselecteerde taxa (voornamelijk micro-Gastropoda en Ostracoda) zullen worden aangewend voor toepassingen bij de reconstructie van paleo-ecologie en -klimaten op basis van fossielen, evenals voor toepassingen als bio-indicatoren voor milieuverstoring en -vervuiling.

### 3. De zending

Zowel voor het voorgestelde taxonomische, biogeografische als fylogenetische onderzoek is materiaal uit een regelmatig netwerk van bemonsteringsstations langsheen de gehele kustlijn van het Tanganyikameer noodzakelijk. Momenteel is er vooral materiaal beschikbaar uit museumstalen afkomstig uit geïsoleerde localiteiten, evenals uit onze eigen omvangrijkere en recentere collecties verzameld langsheen de gehele kust van Burundi en Tanzania tussen Kigoma en Kipili (expeditie Tanganyika 1992).

Deze expeditie had tot doel het meest zuidelijke gedeelte van de Tanzaniaanse kust evenals de gehele Zambiaanse kust te bemonsteren en dit aansluitend op het eindpunt van de vorige expeditie (Figuur 1).

In het kader van de vooropgestelde objectieven werd de te bestuderen kustlijn om de 10 tot 20 km kwalitatief bemonsterd tussen 0 en max. 30 m diepte door middel van hand- en netvangsten met snorkel en scuba. Kwantitatieve bodemstalen werden vanop het schip verzameld met behulp van een PONAR-grijper en dreg (maximum 67m diepte).

### 4. Het verzamelde materiaal

#### Partim 1: Pisces (Cichlidae)

In totaal werden ruim 3.000 vissen verzameld waarvan het merendeel behoort tot de familie Cichlidae. Van de nog levende specimens werden representatieve kleurpatronen geregistreerd door in totaal 500 dia's te nemen.

In principe werden alle verzamelde cichliden in 75% ethanol gefixeerd. Wanneer echter te grote aantallen (> 20) van eenzelfde soort op dezelfde localiteit gevangen werden, fixeerden we de overvallige specimens in formol. De meeste niet-cichliden werden ook in formol gefixeerd.

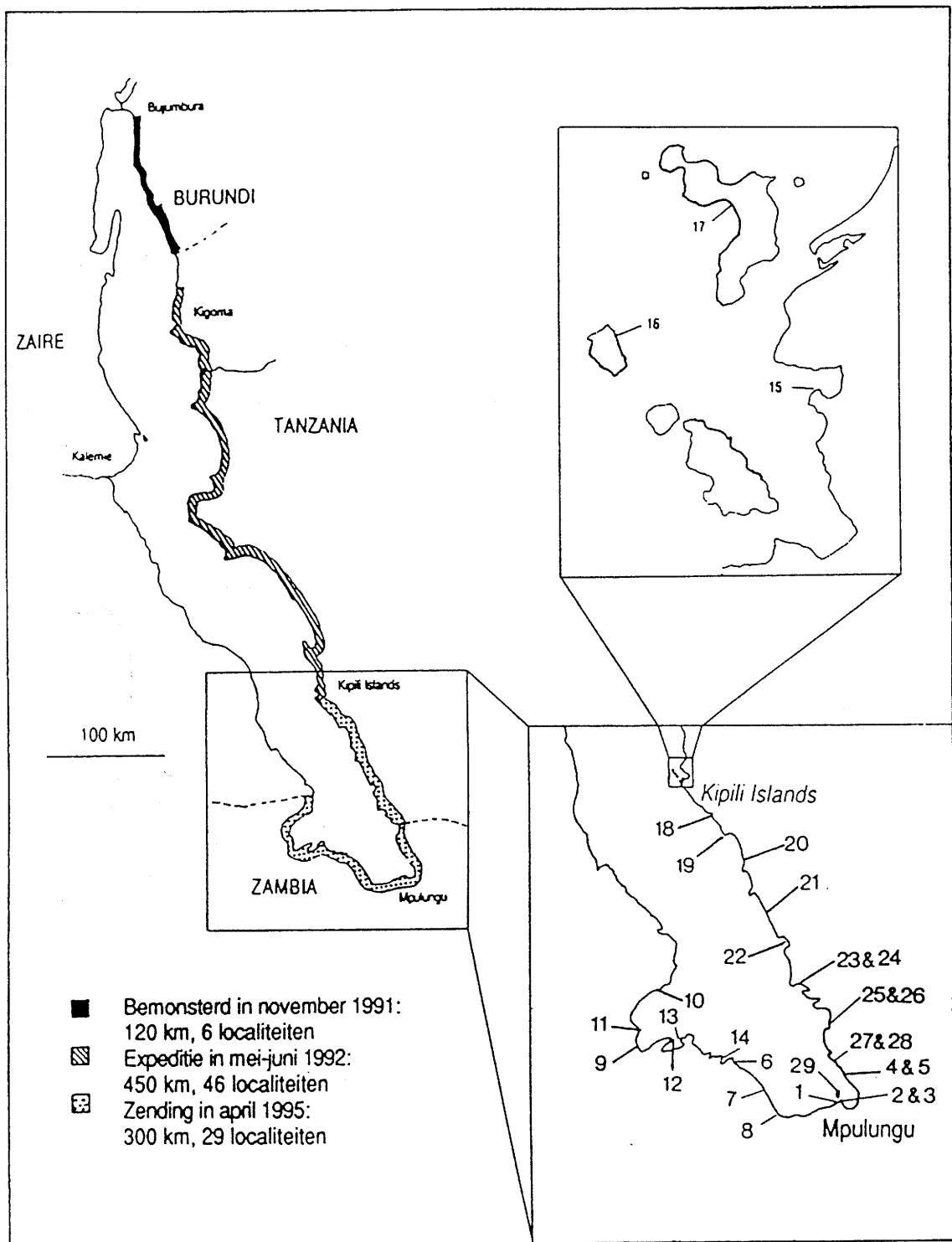
#### Partim 2: Crustacea (Ostracoda)

Gedetailleerde opgave van talrijke localiteiten in het zendingsverslag.

#### Partim 3: Gastropoda

De bemonstering van de Gastropoda gebeurde in het kader van twee onderzoeks-programma's:

1. Specifieke en intra-specifieke variabiliteit binnen het genus *Lavigeria* (door Ellinor MICHEL). Hiertoe werden in de verschillende localiteiten met scuba een tiental exemplaren van elke aanwezige soort en vorm verzameld. Eén localiteit (Ninde Bay, Tanzania) leverde niet minder dan zes *Lavigeria* soorten/vormen op, dit is een record. Na quantificeren van de uitwendige morfologie werden de schelpen gebroken en de weke delen bewaard in 90% ethanol voor DNA-analyse.



Figuur 1

Overzichts- en detailkaarten van het bemonsterde gedeelte van het Tanganyikameer. De localiteitnummers geven de vangstplaatsen weer waar kieuwnetten werden uitgezet.

2. Levend materiaal werd verzameld van zoveel mogelijk vertegenwoordigers van alle endemische Tanganyika gastropodengenera (door Kelly WEST). Verzamelen gebeurde door handvangsten met scuba, alsook met PONAR-grijper en dredge. Vermits dit onderzoek zich eveneens op DNA analyse toespitst, konden enkel levende exemplaren worden gebruikt. Tijdens deze bemonsteringen werden enkele spectaculaire vondsten gedaan:
- In Cameron Bay (by Sumbu, Zambia) werd een levend exemplaar van *Bathynellia* met dredge opgehaald; dit is de eerste maal sinds 1890, vermits latere expedities steeds enkel lege schelpen verzamelden.
  - In de stalen van Nkamba Bay (Zambia) werden levende exemplaren van de zeldzame diepwaterslakken *Tiphobia* en *Paramelania* gevonden.
  - In het litoraal (c. 5m diep) van Kala Bay (by Kasaba Bay lodge) werd een nieuw genus van Gastropoda verzameld.

## 5. De bestemming van het verzamelde materiaal

Na het determineren van de verzamelde cichliden en gastropoden zal uit preparaten van de in ethanol gefixeerde specimens het DNA geëxtraheerd worden. De nucleotide sequentie van welbepaalde delen van het mtDNA (cytochroom b: 402 baseparen/ 16s: 471 bp/ gedeelten van het threonine tRNA, het proline tRNA en het meest variabele deel van de d-loop: 450 bp) wordt vervolgens met in ons laboratorium aanwezige PCR en mtDNA sequencering technieken bepaald waarna via zogenaamde 'distance' en 'parsimony' methoden de verwantschappen tussen de bestudeerde taxa zal kunnen worden afgeleid.

De bestaande verspreidingskaarten van de Lamprologini, de Eretmodini, *Ophthalmotilapia* en *Tropheus* zullen aangepast worden aan de hand van de nieuwe vangstgegevens. Verder taxonomisch en morfologisch onderzoek zal gebeuren op een aantal andere taxa.

De specimens zullen in het K.M.M.A. (Tervuren) gedeponerd worden voor eventuele verdere studie.

Voor de Ostracoda zal het sorteren van de specimens onder binoculair minstens 6 maanden in beslag nemen, waarna een niet onbelangrijk deel alfa-taxonomische beschrijvingen noodzakelijk zijn. Daarna zijn van geselecteerde soortengroepen fylogenetische (voornamelijk op basis van hogervermelde externe hemipenismorfologie) en biogeografische analyses mogelijk.

De vergelijking van de aldus bekomen fylogenetische en biogeografische patronen zal bijdragen tot een beter begrip van de oorsprong en de radiaties binnen de drie bestudeerde modelgroepen.

### 1.2. Lic. D. DEHEYN (U.L.B.)

*Caractérisation des propriétés de luminescence de l'ophiure Amphipholis squamata (Echinodermata) originaire de populations de Nouvelle-Zélande et de Papouasie Nouvelle-Guinée.*

16 juin - 6 août 1995.

#### 1. Introduction

*Amphipholis squamata* (Delle Chiaje, 1828) est une petite ophiure qui se caractérise

par sa distribution cosmopolite, par son polychromatisme (elle présente différentes variétés de couleur) et par sa capacité à produire de la lumière.

Le séjour scientifique réalisé en Nouvelle-Zélande (du 16 juin au 5 juillet 1995) et en Papouasie Nouvelle-Guinée (du 6 juillet au 6 août 1995) avait pour but de décrire les variétés de couleur et les propriétés de photogénèse des ophiures néo-zélandaise et papoues. Il s'agissait également (expériences réalisées uniquement en PNG) (1) de savoir si la luminescence des ophiures est sujet à un rythme circadien, (2) de déterminer si le fait de produire de la lumière est fonction de la bathymétrie de l'habitat des animaux et (3) de décrire les conditions naturelles de la production de luminescence. Les paramètres choisis pour caractériser la photogénèse des ophiures sont l'intensité maximale de la lumière émise ramenée par unité de longueur de bras,  $L_{Max}/L_{bras}$  (exprimé en  $Mq/sec/mm$ ) et le temps écoulé entre la stimulation chimique -KCI- et le moment où la luminescence atteint sa valeur maximale,  $TL_{Max}$  (exprimé en sec).

## 2. Population de Nouvelle-Zélande

La récolte des ophiures s'effectue à Portobello (District de l'Otago) dans la zone de cailloutis sur sable détritique qui recouvre la moitié inférieure de la zone médio-littorale. Il est établi, sur base de la couleur du disque et des bras, que les ophiures appartiennent à trois variétés de couleur différentes: les variétés beige, brun-noir et gris-noir.

Les ophiures de la variété beige présentent un disque et des bras de la même couleur beige à brunâtre (seuls les boucliers radiaires -plaques périphériques du disque en position radiale- sont quelquefois plus foncés). Les ophiures de la variété brun-noir ont un disque foncé (noir, gris ou brun) avec les boucliers radiaires blancs; les bras sont gris ou bruns teintés de jaune et présentent deux à trois articles blancs dispersés de manière éparsée sur leur longueur. Les ophiures de la variété brun-gris ont un disque foncé (brun ou gris) parsemé de quelques taches noires et des bras gris pâle teintés de vert; les bras présentent deux à trois articles blancs dispersés sur leur longueur. Chacune des variétés de couleur émet une lumière dont l'intensité lui est propre ( $p < 0.0001$ ).

Comme les ophiures pouvaient être infestées par différents parasites, il s'agissait de disséquer les ophiures, de noter leur état d'infection (infesté vs non infesté) et de déterminer tant que faire se pouvait l'espèce de l'organisme infestant. Deux crustacés copépodes sont parasites des ophiures néo-zélandaises: l'un est intraboursal (*Parachordeumium amphiuræ*) et infeste 3 % des ophiures récoltées (seules les ophiures de la variété brun-noir abritent le parasite, Tab. 2); l'autre est externe (*Cancerilla tubulata*) et infeste 8,5 % des ophiures de la variété beige et 10 % des ophiures de la variété brun-gris (Tab. 2). Un troisième organisme parasite (un turbellarié rhabdocoele dont l'espèce à déterminer) infeste 5 % des ophiures beiges et 13 % des ophiures de la variété brun-noir (Tab. 2) (Rmq: les effets des parasitoses sur la luminescence des ophiures n'ont pas été étudié au cours de ce travail).

## 3. Population de Papouasie Nouvelle-Guinée

La récolte des ophiures s'effectue sur le platier coralligène de l'île de Laing (baie de Hansa, Province de Madang). Les animaux sont trouvés en abondance sur la partie est du platier, dans la zone supérieure du médio-littoral, sous les morceaux de coraux morts qui sont émergés à marée basse. Les ophiures sont toutes de la variété beige

pâle: elle présentent un disque et des bras très peu pigmentés, ce qui fait qu'elles apparaissent blanchâtres. Le disque peut toutefois paraître légèrement beige et la partie aborale et proximale de chaque article brachial finement pigmentée.

Les mesures de luminescence des ophiures ont été réalisées à différents moments d'un cycle de 24 heures: entre 14 et 18 h (mesures diurnes) et entre 0 et 4 h (mesures nocturnes -réalisées uniquement pendant la période de nouvelle lune). Les ophiures dont la luminescence est analysée pendant la nuit produisent une lumière de plus faible intensité ( $p < 0.0001$ ) que celle des ophiures stimulée pendant la journée. Notons que les animaux ne présentaient aucun signe de parasitose.

Les ophiures ont également été récoltées en plongée dans la zone infra-littorale, par 12 à 15 mètres de fond. Le seul endroit où les animaux ont été trouvés à cette profondeur est situé dans la baie de Hansa (qui entoure l'île de Laing), au niveau de l'épave "Sushimaru". Les ophiures y sont récoltées sous les morceaux de coraux morts qui reposent sur le sable détritique et vaseux. Les individus appartiennent à la variété beige pâle. Les ophiures récoltées en profondeur présentent une luminescence dont l'intensité est plus faible ( $p < 0.0001$ ) que celle des ophiures récoltées dans la zone intertidale (partie est du platier de l'île). Les ophiures récoltées en profondeur ne présentaient aucun signe de parasitose.

Il était également question de déterminer les conditions naturelles du phénomène de production de lumière: la lumière peut-elle être émise en réponse à un stimulus provenant d'un individu de la même espèce ou seuls ceux d'une espèce différente la stimule? L'expérience a consisté à placer dans un espace confiné (petite cuvette contenant 5 ml d'eau de mer) *Amphipholis squamata* avec les diverses espèces d'organismes rencontrées dans le même habitat (la zone supérieure du médio-littoral) et d'analyser la production de lumière de l'ophiure. Les six situations suivantes ont été analysées:

- I. Une *A. squamata* seule
- II. Quatre *A. squamata*
- III. Une *A. squamata* et une ophiure non lumineuse de taille similaire: un jeune individu de *Macrophiothrix belli*
- IV. Une *A. squamata* et un turbellarié
- V. Une *A. squamata* et un crabe
- VI. Une *A. squamata* et une crevette

(Rmq: les espèces de turbellarié, crabe et crevette sont en cours de détermination)

Selon la fréquence et l'intensité des flashes enregistrés, quatre catégories de réponses ont été distinguées (A,B,C ou D):

- A. Aucune luminescence
- B. Flashes peu nombreux et peu intense ( $< 100$  Mq/sec)
- C. Flashes peu nombreux et intense ( $< 1200$  Mq/sec)
- D. Flashes très nombreux et très intense ( $> 1200$  Mq/sec) s'accompagnant du phénomène d'autonomie brachiale.

Il faut remarquer qu'*Amphipholis squamata* produit une faible luminescence en présence de plusieurs de ses congénères (situation II) et l'intense production de lumière des ophiures en présence de crevettes (situation VI).

Il s'agissait alors de savoir si la luminescence d'*A. squamata* pouvait être un signal de communication interspécifique utilisé pour repousser des prédateurs potentiels. Les expérimentations ont consisté à placer pendant trois jours dans deux aquariums en



circuit ouvert des *A. squamata* (n = 10 individus), des jeunes *Macrophiothrix belli* (n = 5 individus) en présence (aquarium expérimental) ou non (aquarium contrôle) de crevettes (n = 3 individus). Les résultats obtenus indiquent qu'autant dans les conditions expérimentale que contrôle les jeunes ophiures *M. belli* sont toutes présentes et entières (*i.e.* sans autonomie brachiale) au terme de la période d'expérimentation. Il n'en est pas de même pour les *A. squamata*: les individus sont toujours présents et entiers dans les aquariums contrôles alors que *ca.* 80 % d'entre eux sont tués dans les aquariums expérimentaux (de nombreux fragments de disque et de bras y sont trouvés).

#### 4. Conclusions

S'agissant du polychromatisme et des propriétés lumineuses d'*Amphipholis squamata*, les résultats obtenus en Nouvelle-Zélande et en Papouasie Nouvelle-Guinée sont à intégrer à une étude plus vaste portant sur les variations géographiques des variétés de couleur et de la photogénèse des ophiures. Ce sujet est développé dans un manuscrit en phase finale de rédaction et ne sera donc pas repris ici.

Les expérimentations menées en Papouasie Nouvelle-Guinée indiquent qu'*A. squamata* présente un cycle circadien dans ces capacités à produire de la lumière. La luminescence est en effet plus intense la journée que la nuit. La photogénèse semble également dépendre de la profondeur étant donné que par plus de 12 m de fond, les ophiures produisent une lumière approximativement 80 fois moins intense que celle des ophiures originaires de la zone intertidale. Il est peu probable que les animaux soient sujet à un "stress barométrique" quand ils sont remontés en surface (ils ne présentent aucune autotomie et montrent une vivacité comparable à celle des ophiures récoltées sur le platier). La faible luminescence des ophiures de profondeur indiquerait donc que la photogénèse dépend de facteurs du milieu, facteurs qui restent encore à déterminer.

#### 1.3. DR. K. VAN WAEREBEEK (Un. Gent en Centro Peruano de Estudios Cetologicos, Lima, Peru)

*Marine Mammal Research and Conservation in Senegal, The Gambia and Guinée-Bissau: 1995 exploratory trip.*  
2-19 September 1995.

#### 1. Introduction

In 1992 in Accra, Ghana, the United Nations Environment Programme (UNEP) organized a successful workshop for marine mammal conservation in the West and Central Africa Region (WACAF). So far no further actions were taken. Present report summarizes results of an exploratory survey (2-19 September 1995) by the author to some countries of the West African region to seek a follow-up on this initiative. The lecturer of the UNEP workshop, Dr Javier Corcuera, and several members of the IUCN Cetacean Specialist Group provided useful information in the preparation of this study visit.

The primary goals included:

1. Identify local scientists and fisheries officials who wish to contribute in management and conservation issues of small cetaceans and other marine mammals;

2. Assess the likelihood of significant dolphin/fisheries interactions, and determine the feasibility and location to help set up a local long-term monitoring program;
3. Determine logistic needs and likely minimum costs for field work, and initiate biological research.

## **2. RESULTS**

### **2.1. Local contacts**

Positive response was received from scientists and fisheries managers at the Institut Fondamental d'Afrique Noire (IFAN) and the Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT) in Senegal, the Department of Parks and Wildlife Management in The Gambia and the Centro de Investigaçao Pesquera (CIPA) and Ministerio das Pescas in Guiné-Bissau.

### **2.2. Dolphin/fisheries Interactions**

Indications are that the main threat to small cetaceans in West Africa arises from expanding fisheries, both artisanal and industrial. In Senegal and Guiné-Bissau I found a worrisome parallelism with western South America in the way "artisanal" fisheries (some more aptly called 'semi-industrial') are developing. The numbers of fishermen are swelling rapidly, especially by young men, unrelated to traditional fishermen's families, who regard fisheries mainly as a money-making business. Together with a tendency of diminished total landings and higher prices, the introduction of new target species and the offshore movement of fishing grounds, all these are warning signs of impending over-exploitation of marine resources. The demand for cheap shark meat, discarded until fairly recently, reportedly is on the rise, as is the use of deadly wide-mesh gillnets.

### **2.3. Surveys of fishing and beach combing**

On the Cap Vert Peninsula, Senegal, the following artisanal ports were visited (some several times): Soumbédioune, Ouakam, Yoff and Hann. I searched beaches at Yoff and Cambérene (more than 12km) but did not find any cetacean remains. On the Petite Côte, we visited M'Bour and the largest artisanal port of Senegal, Joal-Fadiouth. Both M'Bour and Hann are overcrowded with fishermen and merchants of all sorts. It would be virtually impossible to do any sampling of biological data there. Alternatively, Yoff and especially Joal-Fadiouth would be excellent sites for field work. In the Casamance I checked the fish market of Ziguinchor several times, without seeing cetacean meat.

Mr. Raúl Insumbo of the Ministry of Fisheries of Guiné-Bissau accompanied us for a tour of the Bissau harbour. Domestic artisanal fisheries are limited but foreign (especially Senegalese) fishing boats ply these waters. In a meeting with Mr. Tous (IUCN, Bissau) we discussed current developments of artisanal fishing effort in the country. Worrysome is the increase in the use of gillnets and the beginning of a shark fishery. In the Gambia we concentrated on meeting officials and did not have the opportunity to check out landing sites. However, except the port of Banjul, most are quite remote and hard to access.

A very similar pattern preceded a steep increase in incidental takes and, finally, a directed fishery for dolphins and porpoises at well-studied sites in Peru, Ecuador, Sri Lanka and the Philippines. Standard monitoring of cetacean takes and, where possible, dedicated biological data collecting should be started as soon as possible in Senegal and Guiné-Bissau.

## 2.4. Initiation of biological research

### 2.4.1. Preliminary research

Common dolphin *Delphinus* material from West Africa kept at the Zoological Museum, University of Amsterdam, was studied for a note on the taxonomy (VAN WAEREBEEK and VAN BREE, 1995). An interesting unpublished record of false killer whale from Gabon was discovered (VAN WAEREBEEK and DE SMET, 1995). Gathering of information on West African cetacean holdings in important collections of the world is in progress.

### 2.4.2. IFAN cetacean collection

The most important cetacean collection of West Africa is deposited partly at the IFAN building of the University Cheikh Anta Diop in Dakar, and partly at Gorée Island. During my stay in Dakar, I trained A. Djiba and M. Diallo in the identification and craniometric methods of cetaceans. Aided by Djiba, I measured most *Delphinus* skulls at the Dakar IFAN museum. The presence of both short-snout common dolphin *Delphinus delphis* and long-snout common dolphin *D. capensis* in Senegal waters could be confirmed, which will be the subject of a future paper with Djiba and Diallo.

Unfortunately, the collection at Gorée Island (an estimated 100-150 skulls) was not accessible, since it was moved from the host Maritime Museum to the private home of the conservator of the Fort d'Estrées Historical Museum (nobody at IFAN even knew this). Skulls were simply stacked one on top the other in a dark vault. It was agreed that steps would be taken to transfer the collection from Gorée to Dakar and thus have it available for study. A thorough clean-up and full revision of associated data will be necessary.

### 2.4.3. Sightings

Many sightings of bottlenosed dolphins *Tursiops truncatus* were made: between Ziguinchor, Casamance, and Dakar; on Casamance river off Pointe St George; on Carabane Island; and in the Atlantic Ocean. Full details are given in the report.

## 3. Prospects for Cooperative Future Work

1. A project proposal will be drafted in collaboration with Senegalese colleagues Djiba and Diallo and will be presented to UNEP, IUCN and/or WDCS. It should fund two years of systematical data and sample collecting from by-caught dolphin carcasses at Joal-Fadiouth, Senegal. Once a standardized scheme is defined, and depending on official response, other collecting sites will be included such as in Guiné-Bissau or The Gambia. I will remain in regular contact with Djiba and Diallo to coordinate progress.
2. A study of the general biology and morphological variation of *Delphinus* spp. in Senegal waters has started (VAN WAEREBEEK, DJIBA, DIALLO)
3. VAN WAEREBEEK, DJIBA and DIALLO agreed to work on a thorough review of available information on cetaceans of Senegal and The Gambia. All available data will be digitized in the process.
4. I will attempt to establish contacts (by mail) with scientists in the Ghana/Ivory coastal area and Cameroon/Gabon area. Depending on available funding for 1996 and, in particular, prospects for UNEP/IUCN funding for the proposed Senegal collecting phase, deemed a priority, a pilot survey as presented here is planned in the Gulf of Guinea area. However, as always a very high degree of flexibility should be maintained to maximise input from chance opportunities.

#### 1.4. Dr. P. CORNELIUS (The Natural History Museum, London)

*Achievements during field and study work financed partly by the King Leopold III Fund.*

23 August - 7 November 1995.

##### 1. Introduction

The funds were specifically requested for visits to the Philippines, but advantage was taken to extend the activities to include visits also to Australia, Malaya and Thailand pursuant to the same overall project. The overall project is preparation for and study towards production of a monograph on the Scyphomedusae and Cubomedusae of the world and a corresponding field guide, and minor contributory projects on the systematics and taxonomy of these groups.

Video footage was successfully taken of all species seen, to provide material for an artist to work from, and also underwater and terrestrial still photographs.

##### 2. Philippines, one month

Partly in conjunction with a German zoologist, Dr. T. HEEGER, on secondment to the Marine Biology Section, San Carlos University, Cebu, Scyphomedusae were studied and collected at a variety of sites along the south coast of Cebu and (without HEEGER) neighbouring Bohol Island. Several species were found, notably the first *Rhopilema* for the island, the apparently typically open-sea *Versuriga* which I had not previously seen, and, most important, numerous very large specimens of *Cephea* study of which enabled me to understand the taxonomy of the genus. Since all recorded variation within the genus was represented in the one population at one place and time, I concluded that only one species should be recognised. This result is important, and is contrary to that of all previous authors none of whom, however, had had the opportunity to see numerous, large individuals.

With T. HEEGER the following world checklist of species was drafted, combining our experience:

CORNELIUS, P.F.S. & HEEGER, T. (in typescript) - Annotated world check-list of the species of Scyphomedusae and Cubomedusae.

##### 3. Papua New Guinea, one month

Most of the month was spent on Laing Island, where Scyphomedusae and Cubomedusae were searched for extensively and along neighbouring coastlines from Bogia, around Hansa Bay and along to Boroï and slightly further. Despite much effort, and much time spent in the water, few specimens were found, but the few that were, were interesting. The first recorded specimens in PNG of the quasi-oceanic rhizostome medusa *Thysanostoma thysanura* were found together with its commensal fish which is yet unidentified but is almost certainly also new for PNG, and observations made on the bizarre behavioral relation between the two (the fish protects the medusa from danger by directing its swimming away from predators). I have now seen both species of this tropical genus alive, and have been able to eliminate from consideration a third, invalid species concerning which there had been taxonomic confusion. A paper was drafted while on Laing Island:

CORNELIUS, P.F.S. - A jelly fish (Cnidaria, Scyphomedusae, *Thysanostoma thysanura*) and a fish (Pisces, ...) of genera new to Papua New Guinea, a protective behavioral association between them, and systematic notes on *Thysanostoma*.

A large specimen and several small ones of *Cassiopea* found at Laing Island were interesting in providing comparison with the same species from Indonesia and the Philippines - the same 'local endemism of races' seems to occur in the Indo-Pacific as has been reported from a Caribbean species in successive islands along the Antilles.

*Linuche* was seen by myself for the first time; and the same for large *Carybdea alata*; and further study was possible of *Mastigias papua*, including a large specimen at Madang.

The time on Laing Island coincided with some unusually rough weather, during which part of the western sea-defences were damaged, and was further curtailed by 2 days to fit in with transport arrangements of others along the coast to Madang.

#### 4. Australia

After two months in the field I spent 10 days on holiday at Cairns but during this time spent 4 days in medusa work. I also made extended contact with medical and life-saving association colleagues. During the visit it became apparent to me that the large (> 20 kg) rhizostome scyphomedusa *Versuriga anadyomene* is regular in Australian waters - it is probably their largest medusa, and I have identified about 4 out of 5 Australian records of it: yet it is occasional along the outer great Barrier reef where it is known but had hitherto not been identified to species or even genus (yet it is probably Australia's largest non-colonial invertebrate after giant squid and *Tridacna!*).

#### 5. Malaya

For two weeks I collected in several localities in Peninsular Malaya with Dr. Iekhsan OTHMAN, Department of Biochemistry, Faculty of Medicine, University of Kuala Lumpur, finding a range of local species. Particularly valuable to both me and OTHMAN was seeing two *Chrysaora* species live and determining their species identities - the genus is notoriously 'difficult'. I was also able to check and correct several identifications made by OTHMAN and his co-workers, and hence determined that their claim that *Catostylus mosaicus* was venomous, was wrong. With OTHMAN, the following publication was drafted:

CORNELIUS, P.F.S. and OTHMAN, I - Checklist of the *Cubomedusae* and *Scyphomedusae* (Cnidaria) of the Thai-Malaysian region.

#### 6. Thailand

For two weeks I visited Chonburi University, eastern Thailand, to give a course on medusae to a class comprising researchers and lecturers from a variety of Thai institutions and Universities, and to visit several localities around the Gulf of Thailand to see medusae. Particularly important were some specimens of *Cyanea nozakii* which confirmed my views on this species (it is valid, and distinctive); the first *Phyllorhiza* for Thailand; and a large population of *Rhopilema* which enabled me to solve all but one of the taxonomic problems that have existed in this genus hitherto. As with *Cephea*, only one Indo-Pacific species need be recognised despite the several listed in current taxonomic works and despite the opinions of medical researchers working on venoms (whom my findings will help).

While in Thailand I completed drafting of the following papers, which received input from contacts made and specimens seen:  
 CORNELIUS, P.F.S. - Keys to Thai and Malaysian Cubomedusae and Scyphomedusae (Cnidaria).

1.5. Dr. G. VERSWIJVER (K.M.M.A.)

*Antropologisch onderzoek bij de Turkana, een herdersvolk in Noordwest-Kenia.*  
 19 oktober - 17 november 1995.

Deze zending werd met voorafgaand akkoord van het Leopold III-Fonds uitgebreid met een complementaire zending naar Ethiopië voorzien voorjaar 1996.

Verslag van de beide zendingen nog niet ontvangen.

1.6. V. BOUCHLER, L. TCHEMOUTOVA, M. BOUCHLER & E. IBRAGUIMOVA  
 (Uzbekistan)

*Aral Sea Project 1995.*

Herewith we would like to express our great thanks to the King Leopold III Fund and to the Royal Belgian Institute of Natural Sciences for the assistance and admirable support the Aral Sea Project has received for the preparation of a documentary film on the ARAL SEA, Mission nr 2.

During our work in the Institute we have contacted many important cultural and political personalities, who already have given their interviews on the Aral Sea problem or who are willing to give their comments in the nearest future:

- Princess ESMERALDA from Belgium
- Paul Mc CARTNEY
- Marcel MARSEAU
- Pierre RICHARD
- Bertoldo BERTOLUCCI
- Erland USEFsoon
- Heiner MULLER
- Chingiz AITMATOV
- Philipp MIKLIN
- Bill DAVOREN
- Willem VERMANDERE.

During our work in the Institute we have contacted and received support from many technical sponsors, who made possible for the Aral Sea Project to go on. These sponsors are: IBM, Honda-Belgium, Texaco-Belgium, Ziegler and many others.

In 1995 we were able to organize conferences on the Aral Sea Project with videoscreeing of our films in:

- Vesalius college, VUB, Belgium
- Ecology University, Arlon, Belgium

- Ministry of Education, Luxembourg  
(Youth Movement of Help to the Children of the Aral Sea has began after Project presentation in Luxembourg's schools)
- 3220 Network and Aral Sea International Committee, San Francisco, U.S.A.  
and others.

At present our team is engaged in the following projects:

- A. to edit the documentary film ARAL SEA. Mission N2, where a series of leading personalities in the field of culture, politics, economics and science will give interviews and talks on the Aral Sea problem. We believe that with such important people, taking part in our project, the Uzbek authorities attitude to the Aral Sea is bound to change;
- B. to design CD-rom and Internet page on Aral Sea, and to coordinate the exchange of information about the Aral Sea and suggestions from different scientists, business people, politicians concerning the problem. We already have representatives, who are ready to collaborate voluntary in this network in Tashkent, Moscow, Tel-Aviv and San Francisco.
- C. to produce the serial of non-commercial short films "Help to the Aral Sea".

So, ones more, the Aral Sea Project team thanks all the staff of the Royal Belgian Institute of Natural Sciences and the King Leopold III Fund for Nature Exploration and Conservation for the admirable help they provide to the project.

- 1.7. **Dr. K. VAN WAEREBEEK** (Un. Gent en Centro Peruano de Estudios Cetologicos, Lima, Peru).

*Progress Report of the Peruvian Center for Cetacean Research, 1995.*  
Compiled by K. VAN WAEREBEEK, M.-F. VAN BRESSEM and J. ALFARO

## 1. SCIENTIFIC RESEARCH

### 1.1. Species and stocks studied

During the past year studies were conducted on the following species and stocks in the following areas:

Long-beaked common dolphin, *Delphinus capensis* - eastern South Pacific; eastern North Atlantic (West Africa);

Short-beaked common dolphin, *Delphinus delphis* - eastern South Pacific; eastern North Atlantic (West Africa);

Dusky dolphin, *Lagenorhynchus obscurus* - Peru;

Bottlenose dolphin, *Tursiops truncatus* - Peru;

Burmeister's porpoise, *Phocoena spinipinnis* - Peru;

Lesser beaked whale, *Mesoplodon peruvianus* - Peru;

Bahamonde's beaked whale, *Mesoplodon* sp.n. - Juan Fernandez Archipelago, Chile.

### 1.2. Common dolphins

A major research effort, started in 1994, set up to analyse the abundant information on the biology of common dolphins from the Southeast Pacific collected in the past

decade, was continued. Biologists from Ecuador, Colombia and Peru are collaborating on the issue. The first results, a study of the distribution, taxonomy and cranial morphology (VAN WAEREBEEK et al. 1996), and a parasitological survey (ALFARO et al. 1996) in 440 *D. capensis* and 33 *D. delphis* are nearing completion.

Subsequent papers presently in preparation will address feeding, reproductive parameters and growth. A parallel study of the taxonomy of common dolphins from West Africa also demonstrated the presence of both short-beaked and long-beaked species in that area (VAN WAEREBEEK and VAN BREE, in prep.).

### 1.3. Dusky dolphins

New evidence from stomach contents, mostly otoliths and squid beaks, indicates that dusky dolphins from Peru are more catholic in their feeding habits than an earlier study had suggested.

VAN WAEREBEEK, with Dr. Peter BEST (University of Pretoria) and Dr. Peter VAN BREE (University of Amsterdam) documented the first confirmed records of dusky dolphins from the southern Indian Ocean and from Gough Island in the southern mid-Atlantic. Moreover *Prodelphinus petersii* from Amsterdam Island was re-assigned to this species.

### 1.4. Beaked whales

After considering comments from repeated reviews by several world authorities on ziphiids, the formal description of a new extant species of beaked whale *Mesoplodon* sp.n. (Cetacea, Ziphiidae) from the Juan Fernandez Archipelago, Chile, was finalized (REYES, VAN WAEREBEEK, YANEZ and CARDENAS, in press). An earlier manuscript presenting new biological data on seven lesser beaked whales from Peru was updated and is currently readied for submission (REYES and VAN WAEREBEEK, in prep.).

### 1.5. Sightings data

ALFARO was contracted by the government research institute Instituto del Mar del Peru (IMARPE) to serve as marine mammal expert during Oceanographic Cruise 9511-12 on the R/V Humboldt. An approximate 2,457 nautical miles of transects were made in Peruvian coastal waters from 21 November-20 December 1995. Total observation time was 189.05 hours during which 61 cetacean sightings were made, including of *L. obscurus*, *D. delphis*, *D. capensis*, *T. truncatus*, *Grampus griseus*, *Mesoplodon* sp., *Globicephala* sp., *Physeter macrocephalus*, *Megaptera novaeangliae* y *Balaenoptera* spp. The results will be pooled with data collected by Milena Arias from similar IMARPE surveys and processed into a paper. The surveys open opportunities for closer collaboration with IMARPE.

### 1.6. Immunology

Thymus and spleen play an important role in the immune response in mammals. However, in cetaceans little is known of their normal macroscopical and microscopical morphological features and development with age. Karina ONTÓN, supported partly by CONCYTEC is completing a study on these parameters in *L. obscurus*, *D. capensis*, *T. truncatus* and *P. spinipinnis*. Conclusions will be presented in the form of ONTÓN's licentiate thesis, to be defended by mid-1996, and will subsequently be published in the primary literature.

### 1.7. Serum sample collection

Bacterial and viral infections induce the secretion of specific antibodies in the blood



which may persist for years and can be detected by specific tests. Thus, blood samples represent a useful tool to investigate the occurrence of infectious diseases. At CEPEC the collection and storage of serum samples was started in 1993 and continued throughout 1994-95. Presently, our serum collection includes samples from 35 *L. obscurus*, 10 *D. capensis*, 8 *T. truncatus* and 20 *P. spinipinnis*. Results of preliminary serological investigations are discussed below.

## 1.8. Viral diseases

### Poxvirus

VAN BRESSEM and VAN WAEREBEEK (1995, in press) studied the epidemiology of poxvirus infection in 327 small cetaceans of four species from Peruvian waters. In June 1995 we initiated a project to isolate and characterize the virus(es) from tattoo skin lesions in collaboration with Dr. Malcolm BENNETT of the Department of Veterinary Clinical Science at the University of Liverpool (UK).

### Morbillivirus

The presence of morbillivirus-specific antibodies was checked in four species of Peruvian small cetaceans in collaboration with Dr. Tom BARRETT of the Institute for Animal Health, Pirbright, England. Results are presently under study.

### Genital warts

We observed genital warts in three dolphin species and the Burmeister's porpoise and studied the histological and epidemiological features of the disease. A paper on this subject was submitted to Diseases of Aquatic Organisms (VAN BRESSEM et al. 1995). Molecular investigations on the etiology of the infection were carried out in collaboration with Dr. G. ORTH, head of the Department of Papillomavirus at the Paris Pasteur Institute. Findings are discussed in a document currently in progress.

## 1.9. Bacterial and organic diseases

### Genital pathologies

Genital pathologies including ovarian cysts and tumours, uterine fibromas and vaginal calculi have repeatedly been noted in *L. obscurus* since 1984. Histology and epidemiology are under study in collaboration with Dr. U. SIEBERT from the Department of Veterinary Pathology at the University of Giessen, Germany. A preliminary analysis of data is meant to be presented at the 48th Annual Meeting of the Scientific Committee of the International Whaling Commission in Aberdeen, Scotland, next June.

### Cutaneous diseases

We hold data records of severe, invasive, possibly infectious, skin lesions in *L. obscurus*. Histology and the possible etiology of these lesions are investigated together with dermatologist Dr. ROSA of Lima, Peru.

### Congenital aberrations

Little published information exists on genetic and/or congenital abnormalities in small cetaceans. The observation of an aberrant skull in a dusky dolphin led us to screen our dataset to estimate the prevalence of genetic anomalies in cetaceans caught off Peru in 1984-1995.

### Brucellosis

Preliminary results of a serological survey carried out in collaboration with Dr. J. GODEFROID (National Institute for Veterinary Research, Brussels, Belgium) indicate the presence of *Brucella* antibodies in *P. spinipinnis*, *L. obscurus*, *D. capensis* and *T. truncatus*. CEPEC member Ruth BELLO recently initiated a licentiate thesis on brucellosis in these species under the supervision of MFB and KVV.

#### **1.10. Scientific meetings**

As in other years KVV was invited to contribute to the Small Cetacean Subcommittee (Scientific Committee) at the 47th Annual Meeting of the International Whaling Commission (IWC) in Dublin, Ireland, in May 1995. Two papers, one concerning cetacean mortality in fisheries in 1994 both in Peru and Ecuador and the controversial issue of the danger of a commercial live-capture dolphin fishery developing in Peru (VAN WAEREBEEK et al. 1995; VAN WAEREBEEK and ALFARO 1995).

MFB attended the 11th Biennial Conference on the Biology of Marine Mammals in Orlando, Florida, from 14-18 December 1995 and presented a paper on the epidemiology of poxvirus in Peruvian small cetaceans (VAN BRESSEM and VAN WAEREBEEK 1995).

## **2. CONSERVATION**

### **Monitoring of dolphin exploitation**

Following a nation-wide campaign for a better protection of Peru's small cetaceans, organized by CEPEC, Cruzada por la Vida, and backed by RENACE and the media, the Ministry of Fisheries (MIPE) reconfirmed the ban on exploitation by a new ministerial decree in August 1994. Although enforcement improved, compliance remained entirely dependent on MIPE.

We assessed the efficacy of the ban at several fishing ports in central (Chancay, Cerro Azul, Tambo de Mora) and northern Peru (Puerto Pizarro, Zorritos, La Cruz, Cancas, Mancora, Los Organos, Matacaballo, Constante, Parachique, Bayovar, Talara, San José, Chimbote, Salaverry). Nevertheless monitoring effort was necessarily limited for financial reasons. In late 1995, a novel collaborative scheme was implemented in which CEPEC biologists gathered data for IMARPE.

After congressman Mr. Antero FLORES A. repeatedly contacted CEPEC for technical guidance on a law proposal to permanently prohibit small cetacean exploitation in Peru, Congress adopted the law proposal on 17 November 1995. We now only await presidential ratification which would crown 10 years of CEPEC efforts to exact full legal protection for cetaceans.

Preparatory arrangements were made to start well-supervised dolphin-watching activities in northern Peru in collaboration with the Government of the Grau Region. A project proposal is submitted and currently in consideration by the Tourist board.

## **3. EDUCATION**

### **3.1. Basic education**

#### Environmental classes

Environmental classes, started in 1993, were continued at the primary school "Colegio Nacional N° 6010 Hilda B. Carrillo A." and the high school "Colegio Nacional Mixto Manuel F. Calvo Pérez", both at Pucusana. Each educational session,

attended by 30-40 students, consists of an introduction to a relevant environmental subject, followed by the commented projection of a carefully selected video.

Afterwards, a guided discussion takes place and the students are invited to raise questions. Some teachers of the primary school also participate soliciting children to create compositions or invent tales related to the current topic of interest.

In November 1995, environmental classes were started at the primary school of Cerro Azul (130km south of Lima), a fishing community long monitored by CEPEC researchers because of its high numbers of dolphins and porpoises being captured each year, including by a harpoon fishery. Children (8-10 years) showed genuine interest and the school director kindly invited us to continue and expand the classes in the following months.

Finally, miscellaneous environmental talks were given year-round to students of several primary and high schools in Lima, focusing on dolphin biology and conservation.

#### Educational booklet

To stimulate the interest and heighten the knowledge about cetaceans, and other endangered marine animals, among the youngest children of fishermen, we composed a comic booklet "Colita" on the life and adventures of a young dusky dolphin, the species most heavily exploited in Peru, and its aquatic friends. Numerous drawings illustrate the story, emphasizing basic dolphin biology and faced threats.

A request for financial support presented to the Peruvian Banco de Credito was approved and the booklets were mass-produced. These were distributed to 7-11 year old children in schools and the story was read during environmental classes. Small hand-made prizes rewarded the children who had done the best job in colouring the line drawings of their booklets. A limited follow-up enquiry revealed a greatly increased awareness. Even after many months most children still vividly remembered the story, and we even heard of cases where children pointed out to their parents why they refused to eat dolphin meat served at home.

#### Drawing competition

To focus on the different threats the world oceans have faced this year, a drawing competition was organized in collaboration with two other environmental groups in Lima (see below) treating the themes of nuclear testings, pollution and overexploitation of marine biological resources. A poster was printed and distributed. This competition, addressing both primary and high schools students of Lima, Pucusana and Cerro Azul, met a great success with more than 250 drawings being submitted. Dolphins, sealions and sea turtles, as well as other aquatic animals were most frequently depicted by the Pucusana youngsters, showing the impact the marine environmental classes were having on them.

### **3.2. Advanced education**

Several CEPEC members made important progress in their university education. Ruth Bello graduated as 'Bachiller en Biología (bachelor's degree) from the Universidad Nacional Agraria La Molina and is now preparing to start a licentiate thesis project. Biologists Aquiles GARCIA-GODOS (Universidad Agraria) and Karina ONTÓN (Universidad Ricardo Palma) entered the final stages of their thesis program.

Biologist Laura CHAVEZ (University of Hamburg, Germany) and research veterinarian Marie-Francoise VAN BRESSEM (University of Liège, Belgium) will soon be finishing their respective Ph.D. thesis. Finally, several university students visited

CEPEC in search of information on the biology and conservation of cetaceans for various assignments. Robert DOVER received field training from KVV to gather data on small cetacean fishery interactions for the Peruvian Sea Research Institute (IMARPE).

### 3.3. Public awareness campaigns

#### Exhibition on dolphins and whales in central Peru (Pucusana)

From January to mid-March 1995, we organized an "Exhibition of Dolphins and Whales" set up in a classroom of the primary school 'Hilda B. Carrillo' of Pucusana.

A sample of skulls of some twenty species of Peruvian cetaceans, selected from the extensive CEPEC collection, was presented to the public for the first time. Cranial specimens of sealions, otters and marine turtles were exhibited as well. Natural-size flat models of the most representative species offered visitors a sense for the dimensions and colouration patterns of these animals. Dolphin fetuses at different stages of development and complete mounted skeletons facilitated anatomical comparisons with humans and other mammals. Explicative panels were designed and painted by Karen GEYSEN, an artist collaborator of CEPEC, and supplemented with explanatory text. During guided visits we provided further information on the natural history of dolphins and porpoises, the conservation problems they face and how members of the public can help.

The exhibition was visited by more than 500 persons, among locals, tourists from Lima and a few foreigners. Most people showed a genuinely interest as evidenced by their abundant questioning, however nothing equalled the extreme curiosity of children, especially local kids, many of which returned over and over again with friends.

#### Exhibition on dolphins and whales in northern Peru (Region Grau)

In September 1995 we were invited by the National Cultural Institute, Piura, in northern Peru, to show part of the exhibition on whales and dolphins earlier organised in Pucusana during festivities of the 'Week of the Cultural Identity of Piura'. Logistical support was provided by the Institute and the Banco Regional del Norte. The exhibition, preceded by an official opening ceremony with talks was highly successful and was attended by a great number of adults and children from primary and high schools of the northern provinces.

#### Forum 'Conservation and Protection of [River] Dolphins': Iquitos

In June 1995 we were invited to participate and give a talk on small cetaceans at a forum on the conservation and protection of dolphins organized by NGO RENACE-Peru at the occasion of the "International Day of River Dolphins". This forum took place at the National University of the Peruvian Amazon and gave rise to fruitful discussions on the conservation and management of freshwater and marine cetaceans between various environmental groups, experts, students and the public.

#### Preparation of articles for popular press

KVV agreed with editor-in-chief S. CARRILLO of Pucu-Sur, a touristic monthly, catering to the interests of southern resort towns, to prepare popular articles on Peru's dolphins and whales and other marine ecology topics of general interest.

CEPEC members also wrote several articles for leading daily newspapers as 'El Comercio' and 'La Republica'. Finally on the request of the new magazine

'Oceanus', two of us (JAS and KVV) prepared an article on the threats fisheries in Peru's waters pose to local cetacean stocks. Oceanus is read by businessmen and administrators of the fishery industry as well as the professionals involved in the marine and fisheries sciences in Iberoamerica. The magazine seems to be a direct way to reach those groups.

### 3.4. Collaboration with other organisations/consultancy service

#### Collaboration with other conservation groups in Peru

The NGOs RENACE-Peru and Cruzada por la Vida approached CEPEC in 1994-95 for scientific and educational support for their campaigns. Since then a close collaboration with these NGOs has developed and several educational activities have been undertaken jointly, as for example the drawing competition. RENACE invited us to participate in the Forum 'Conservation and Protection of Dolphins' and since then repeatedly asked us to give talks to the network of primary and high schools in Uma with which they have collaborative links. Members of Cruzada por la Vida provided logistical support in our contacts with school boards at Cerro Azul and joined us during the first environmental classes.

#### Collaboration with official institutions

Increasingly scientists of CEPEC and the official Instituto del Mar del Peru (IMARPE), in particular its marine mammal group, are interchanging information of mutual interest. Prospects are good for joint research projects in a near future. The same is true for cooperation with the regional government of the Grau Region in matters of marine ecotourism (see above). Following the signing of a Memorandum of Understanding (Convenio) with the Municipality of Pucusana on 4 November 1994, CEPEC acts as an official consultancy body in environmental matters for the Pucusana municipal council. This advice is provided freely.

#### Transnational cooperations

Close long-term cooperative ties were maintained with, among others in Latin America, the Fundación Ecuatoriana de Estudios de Mamíferos Marinos (FEMM), Universidad de Antofagasta (Chile), Museo Nacional de Historia Natural de Santiago de Chile, Universidad Jorge Tadeo Lozano de Bogota, Centro Informativo Peninsular de Guaymas (CINAP, Ecuador), the Antarctic and Southern Ocean Coalition (ASOC), FIDE XII (Magallanes), etc. Increasingly CEPEC is implementing a policy of South-South cooperation without however neglecting its valuable traditional links with technologically advanced Europe and North America.

## 4. ACKNOWLEDGEMENTS

We warmly thank the following individuals for their personal help, support and encouragement: Ing. Fernando ABASOLO, Dr. P.J.H. VAN BREE, Guillermo CASTRO, Petra DEIMER, Alfredo DELGADO, Silvia FLORES, Mr. & Mrs. GEYSEN, Dr J.P. GOSSE, Felipe HACKER, Steve LEATHERWOOD, Luis NIERI, Andres OCAMPO, Vassili PAPASTAVROU, Bill ROSSITER, Jeremy WARREN, and the VAN DER DRIESSCHE family.

We wish to thank the following institutions for their financial or logistic support. For major funding, the Gesellschaft zum Schutz der Meeressäuger (Germany) and

the IUCN Cetacean Specialist Group (CSG). MFB was supported by the Belgian Agency for Development Cooperation (AGCD). Specific projects or CEPEC activities were supported by: Americana de Aviación, Banco de Credito del Peru, British Council, Centro Europeo de Información y Promoción para America Latina (CEIPAL), Cetacean Society International (CSI), Consejo Nacional de Ciencias y Tecnologías (CONCYTEC), Consorcio de Colegios Católicos, Dirección de Turismo, Industria e Integración de la Región Grau (Peru), Foundation Lefranc (Belgium), International Fund for Animal Welfare (IFAW), International Whaling Commission (IWC), King Leopold III Fund for Nature Exploration and Conservation, Marine Education and Research, New England Aquarium and Transportes Olano (Oltursa).

**2. Rapport d'activités de la Station biologique Léopold III à l'île de Laing, Papouasie Nouvelle-Guinée**  
**Verslag over de activiteit op het Biologisch Station Leopold III, Laing Island, Papoea Nieuw-Guinea**

**2.1. Activités logistiques**

La responsabilité technique, la maintenance et la gestion journalière de la Station biologique Léopold III ont été assurées avec beaucoup de compétence par Messieurs J.-M. OUIN, G. SEGHERS et E. VAN IMPE.

Cette année tous les réservoirs métalliques assurant les réserves d'eau de pluie (seule eau douce sur l'île) ont été remplacé par des réservoir de contenance similaire en plastique inaltérable par les embruns marins. La digue en béton, protégeant le laboratoire du côté est de l'île, a dû être renforcée et prolongée. L'ensemble des toitures des maisons a été remis en état.

**2.2. Activités scientifiques**

**2.2.1. Scientifiques ayant effectués des recherches à la Station biologique:**

**- Université Libre de Bruxelles**

Lic. D. DEHEYN  
 Ir agr. M. LEPONCE  
 Lic. C. LEVY  
 M. J.-M. OUIN  
 Dr Y. ROISIN  
 M. G. SEGHERS  
 M. E. VAN IMPE

**- Université de Liège, Laboratoire de Botanique**

Lic. G. CASTILLO  
 Prof. V. DEMOULIN  
 Dr L. HOFFMAN  
 Lic. R. JACOB

Lic. M. JANSSENS

Dr E. SERUSIAUX

- **Université de Liège, Laboratoire de Zoologie**

Prof. J.-Cl. BUSSERS

Dr M. FRANKIGNOULE

M. J.M. THEATE

- **Koninklijk Belgisch Instituut voor Natuurwetenschappen**

Lic. O. MISSA

Dr. J. VAN GOETHEM

- **Université de Mons-Hainaut**

Dr I. EECKHAUT

Dr D. VAN DEN SPIEGEL

- **Universiteit Gent**

Dr. W. VYVERMAN

- **Université Catholique de Louvain-la-Neuve**

Dr J. MALLEFET

- **Autres Institutions**

A. APROOT (Utrecht University, Netherlands)

M. & N. CLAEREBOUT (Université de Laval, Canada)

Dr. P. CORNELIUS (N.H.M. London, U.K.)

B. & A. GENTON (Malaria Institute, Madang, P.N.G.)

L. LAMBLEY (Museum of Berlin, Germany)

J. OLIVIER (Malaria Institute, Madang, P.N.G.)

B. RENNIE (University of Edinbourg, U.K.)

H. STIPMAN (Museum of Berlin, Germany)

### 2.2.2. Publications

Vingt publications sont parues ou sont sous presse pour l'année 1995, portant ainsi le nombre total des publications relatives à la Station biologique Roi Léopold III à 328.

## 3. Divers - Varia

### 3.1. Conférences - Voordrachten

- Voorstelling van de videofilm "*K.B.I.N. Galapagosexpeditie 1991*"  
door Dr. Léon BAERT en Dr. Konjev DESENDER, K.B.I.N., Departement Entomologie.
- Conférence "*Problèmes liés à la transcription d'une langue de tradition orale - exemple de la langue d'Awar, Province de Madang, Papouasie Nouvelle-Guinée*"  
par Mme Catherine LEVY, U.L.B., Département d'Anthropologie Sociale et Culturelle.

### 3.2. Livres reçus - Ontvangen boeken

De nombreux livres et tirés-à-part ont été reçus en 1995, notamment du Musée royal de l'Afrique centrale.

Het Fonds heeft talrijke boeken en overdrukken ontvangen in 1995, vooral van het Koninklijk Museum voor Midden-Afrika.

Parmi les livres reçus, nous citons les publications suivantes:

Wij vermelden hierna de belangrijkste publikaties:

- Max POLL et Jean-Pierre GOSSE. 1995. Genera des poissons d'eau douce de l'Afrique. *Mémoire de la Classe des Sciences, (3) 9*: 1-324, pls 1-108, figs 1-732.
- G. VERSWIJVER, E. DE PALMENAER, V. BAEKE et A.-M. BOUTTIAUX-NDIAYE. 1995. Trésors d'Afrique. Musée de Tervuren. Catalogue d'exposition, 400 pp., 250 pl.coul.
- "Collected reprints" de la Station biologique Léopold III, île de Laing, vols 10 et 11.

Bruxelles - Brussel, 29.03.1996.