

The New Guinea Tropical Ecology and Biodiversity Digest



Drawing
by Iso

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Issue 9

Please send all contributions and corrections to either the mail, fax, or email address listed below.

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This issue we want to thank the Wildlife Conservation Society for providing financial support -- this is much appreciated!

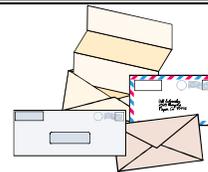
If you have internet access, the digest is available on the web at: <http://www.wcs.org/png.html>

If you want to look at it there and/or print out a hard copy from this site that would save us xeroxing and postage. Please send a note saying that this is fine for you and include your current e-mail address; I will send you an email announcement whenever a new issue comes out so you can check the web site. Thanks!

If you need back issues of the Digest, please let us know and we will mail them to you (or you can download them from the web site).

We try to get a new issue out every six months so the information stays relatively up-to-date. Please don't forget to send in any information you can contribute!

Editorials and Letters



Anybody want to expound on his or her thoughts or solicit opinions about something? Please send in anything that you would like to see appear here! Opinions are from the author and don't necessarily reflect those of the editor or WCS.

The Raggiana Bird of Paradise, their unique habits and how they remotely resemble a human display of arrogance and elegance

From John Ericho, Research and Conservation Foundation of PNG

It was 6 am in the morning in the village of Maimafu in the Crater Mountain Wildlife Management Area (WMA). I was lying on the ground supine looking up into the foliage of an oak tree species. My eyes were glued to the display bough of one of nature's beautiful creatures- our national bird, the Raggiana bird of paradise. This bird is the pride of the nation and is deservedly splashed on things all over the country. It is certainly beautiful when one observes it in the wild. I was one

of a privileged few to observe it in all its glory and in its natural habitat.

A minute after I settled down on my point of rendezvous, a male Raggiana (with the bright plumes) flew in and alighted on the upper display bough, and another one landed on the lower bough. I held my breath and I waited. For the next 40 minutes, I held my breath while the fellows preened themselves. Preening involved shaking their plumes, putting loose feathers into place and realigning the barbs of

the feathers so that nothing was out of place. They were doing small short hops and vocalizing their “come and see us” call all the while. (*This I thought is not unlike the human male spending some time before the mirror making sure that every single hair strand, shirt collar, and tie is in place before he goes to the display area—the dance hall. While for the man in the village it resembles the meticulous care he takes to dress in his traditional attire making sure that every face paint is perfectly applied and headdress is in place before the singing.*) I lay there transfixed; I was about to behold the re-enactment of how my ancestors got their inspiration for preparing for their traditional singing.

Soon after the 40 minutes was over, the dominant male, the one on the upper display bough, changed into a different vocalization-- a high-pitched call at short intervals. I thought this meant “Now we are ready to display; come and see us!!” Then the foliage became alive with three excited females. They were moving here and there, chirping all the time. As soon as there was the physical presence of females, the rest of the fellows got into the act. The act involved both primary and secondary feathers standing up on their ends, tail plumes poking up, wings flapping at short intervals and clucking vocalizations akin to a mother hen clucking for her chicks to come when they are in danger; only this sound was louder and higher in pitch. All the while the birds moved sideways in quick movements. (*This is certainly not unlike when the music in the dance hall is flowing at a high crescendo, the strobe light flashing, the adrenaline pumping as the man loses himself in a morbid frenzy in an attempt to woo the opposite sex for the mating that may ensue in the small hours of the morning.*)

The fellow on the lower bough epitomized how the world is unfair at times. The three female birds never even cast a glance in his direction. The dominant male was the center of the stage, and he had their attention. He thought of all the females and finally settled on the one that was the most aggressive and persistent. The fellow on the lower bough

knew this was not going to work for him as his attempts had been quite futile, and so he stood there in pure solicitude among many potential partners. (*This attitude is quite like the human scene where most females clamor for the attention of the dominant male who has the looks or the money thereby isolating the others. The thing though is that the handsome male has his eye on the most attractive female with the curves and all. So while the females think they are hot candidates for the dominant male they end up playing second fiddle. Those of us without the looks and substance can identify with the fellow on the lower bough.*)

Mating occurred with the dominant male and the aggressive persistent female. This is the story of natural selection in action. The Raggiana story depicts the fact that when dominant males mate with aggressive persistent females, a robust healthy offspring is insured. This happens in all of nature either by instinct or design. (*I suppose we Homo sapiens do that all the time. We all go through a selection process using a certain set of criteria so that we invest in a choice that will ensure healthy and viable offspring that perpetuate our species.*)

In this country, not long ago and even now in some places, the parents did the match-making. Most often beauty did not matter. Girls who were hardworking, hospitable to relatives and strangers, with a healthy body and a good solid set of legs were the main set of criteria for match-making. The latter criterion, good shapely legs, was considered an indication of strong healthy genes. The match-makers were usually right.

So what is common between Birds of Paradise and human beings? Answer: They select strong healthy beautiful partners for robust and viable offspring. I think we should not kill Birds of Paradise as we have so much in common with them-- though they have feathers and we have hair.

Now when you see highlands man dressed in raggiana plumes doing an agitated dance, you will know where his inspiration came from.

Lakekamu Basin Research at the Ivimka Field Station

from Bruce Beehler

In March 1999, I returned to the Lakekamu Basin to visit the Ivimka Camp field station, a 4-hour walk from the Tekadu airstrip, near the boundary of Morobe and Gulf provinces. This was my tenth trip to the Lakekamu Basin, but only my second stay at the Field Station, which is perched on a small hill overlooking the broad expanse of lovely lowland forest that stretches south and east of the station. I was returning to wrap up some field research sponsored by the National Geographic Society that focused on local patterns of species richness within adjacent tracts of forest exhibiting distinct physical structures. With the help of Banak Gamui, Aubita Kairo, Michael Hudson, and several helpful field assistants, we surveyed butterflies, birds, and trees on three pairs of matched plots, one pair in a hilly plot, one pair in a swampy plot, and one in a terra firme plot. This was our second field season of surveys. We have not yet conducted analyses on the data, and the butterflies are still being identified to species, so I don't want to speculate about what we will find. But I am left with some strong impressions from

my work there. First, the Ivimka Camp is a great place from which to do ecological fieldwork. Second, the forest around the field station is rich, heterogeneous, and full of surprises to the fieldworker. Third, Conservation International and the Foundation for People and Community Development welcome additional researchers to visit and work there. I get the impression the station is under-utilized, and so I encourage everyone to visit and have a look. The hike down the Bulldog Road from Tekadu is fascinating, and the view from the station's porch is worth the hike. The weather is always changing and there is nothing like returning in the afternoon to watch a rainstorm build in the distance and then rush up to the station with the sound of the wind and the rush of heavy rain behind you. I don't get to spend much time in the forest any more, what with duties at my office in Washington, DC. So spending time in the heart of the forest, and walking the trails, and flushing a crowned pigeon, or else marveling at a circling Gurney's Eagle, or a raucous group of Vulturine Parrots, is simply sublime.

Keki Lodge, Adelbert Mountains, Madang Province

from Bruce Beehler

After the annual meeting of the Foundation for Peoples of the South Pacific International in Madang (in May 1999) Kevin Vang and I had the remarkable privilege to visit Moyang Okira at his ecotourism project in the Adelbert Range, about three hours north of Madang town. Okira is building a new tourism lodge for naturalists and bushwalkers. The lodge is accessible by road, but is set in lovely hill forest that is as rich and interesting as any I have visited. I recommend that any biologist or conservationist who visits Madang Province should visit Okira's lodge, near Selemben Village. The site is 129 km from Madang. Take the coast road north to Bunabun (97 km) then take the inland road 32

additional kilometers to Selemben. The road gives access to forested uplands to nearly 1000 m elevation. Getting to such environments in the Adelberts used to be a considerable expedition. Here we were able to birdwatch along the main road each morning and watch the Fire-maned Bowerbird foraging on figs, or Banded Yellow Robins chase about in forest understory, or Palm Cockatoos and Vulturine Parrots glide overhead. The Bowerbird is the big attraction. To me it has been a long time since I was able to watch a bird as beautiful as an adult male Fire-maned Bowerbird perch quietly on a dead branch with the strong morning sun illuminating its resplendent plumage. I plan to get back as soon as I can.



New Guinea Conservation Projects



Updates anyone??

Teacher Training Enters a New Phase in PNG

From Janine Watson

This year will see a number of exciting developments in the Conservation Education Teacher Training program conducted by the Research and Conservation Foundation (RCF) of PNG and the Wildlife Conservation Society (WCS). Last year approximately 60 Eastern Highlands teachers were trained in the classroom implementation of innovative, interdisciplinary environmental curricula. Three WCS Conservation Educators traveled from New York to train teachers in the various methods of conservation education and to provide each with an entire set of classroom curricula including teachers' manuals and student worksheets.

In a move towards developing the capacity to run the program from within PNG, this year will see a Train the Trainers Workshop held for some of the most outstanding conservation educators emerging from last years' workshop. Approximately 15 of the most enthusiastic teachers who have been able to implement the environmental curriculum throughout the twelve months following last years' workshop will become trainers for a whole new group of teachers this year. RCF's Conservation Education Officer, Mrs. Lydia Dori, will also take part in the trainers' workshop. This will mean that in the future local teachers, under the guidance of RCF, will be able to offer on-going support for teachers and expand the program to other regions within the country.

Last year, teachers for the four-day curricula workshop came from the Eastern Highlands only, but this year approximately 20 teachers each from Chimbu and Western Highlands as well as approximately 30 Eastern Highlands teachers are expected to attend the training workshop in early April. Thus the program is entering an exciting stage of expansion. The Train the Trainers workshop will take place

prior to the four-day workshop for this new group of Eastern Highlands, Chimbu and Western Highlands teachers so that the teachers trained last year, along with Lydia, can act as trainers for the first time under the guidance of WCS Instructor, Ms. Alison Ormsby.

The course curricula introduced during these workshops have been developed over many years by WCS and have had much success across America and in other countries such as China and Brazil. During the workshops teachers are shown that the natural environment can be used as a base to teach a wide range of topics such as expressive arts, mathematics and English composition as well as 'science' subjects while at the same time making students more aware of the unique resources that exist throughout PNG. An important part of this program is the on-going support that RCF provides for participating teachers and their school groups. RCF produces a Conservation Education newsletter titled: *Ting ting long mama graun*, that features news on what teachers across the region are doing in their classrooms in the area of conservation education and that gives further ideas and activity sheets for classroom use with an emphasis on PNG flora and fauna. RCF has also had a number of school groups visit their office to watch videos or to hear from RCF staff and affiliated researchers about their work. These visits are a prelude to the establishment of RCF's Conservation Education Resource Centre (CERC) where teachers and school groups can come to access RCF's collection of books and videos, to hear from various guest speakers, and to work through various Conservation Education activities. RCF hopes to have their CERC open for World Environment Day, June 5th, 2000.

Kava as a Possible Non-Timber Forest Product for ICADs

From Max M. Kuduk, Deputy Project Manager, WWF KICDP, Kopi

Note from John Duguman of the University of Papua New Guinea: I have just come from Port Vila and Fiji and it

is true that some kava farmers in Fiji are buying vehicles from kava sales. The USP (Institute of Applied Science) are

currently running tests on kava latones. There are some steps now to establish linkages with UPNG Chemistry. On another note the PinBIO setup in DEC under Simon Saulei are looking at fostering kava amongst other non-timber products. I am also encouraging my villagers to grow kava. On another note, Will Akus is running kava tests at NARI Lae.

The following is a letter from Frances Cook, Centre for Economic Botany, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AE, United Kingdom, Tel. (direct) +44 (0) 181 332 5704, Fax. (direct) +44 (0) 181 332 5768, <http://www.rbgekew.org.uk/ceb/>, e-mail: f.cook@rbgekew.org.uk

Kava (*Piper methysticum*) is a plant indigenous to the South Pacific Islands where it is made into a popular drink that is used in a way similar to alcohol in Western society. The psychoactive potency of kava can vary considerably from very weak to strong. Kava rhizomes contain numerous pharmacologically active components that can cause central nervous system (CNS) effects, primarily in the area of reduction of anxiety and sleep enhancement. Heavy use of kava can lead to poor health, including dermatopathy, scaly rashes, red eyes, face puffiness, and visual effects. For further information, I suggest that you refer to the references on kava given below (the book by Lebot et al. is particularly informative). Also, you may be interested in browsing the

internet as it has a great many sites that relate to Kava and there are many sites selling various products based on kava.

Anon.1996. Kava. Lawrence Review of Natural Products (Nov. 1996).

Brunton,R. 1989. The abandoned narcotic: kava and cultural instability in Melanesia. Cambridge, Cambridge University Press. viii, 219p. ISBN 0521373751.

Brunton,R. 1998. The abandoned narcotic: kava and cultural instability in Melanesia. Cambridge: Cambridge University Press, 219p. ISBN 0521373751.

Cox,P.A. & O'Rourke, L. 1987. Kava (Piper methysticum, Piperaceae). Economic Botany 41(3): 452-454.

Kilham,C. 1996. Kava: medicine hunting in paradise: the pursuit of natural alternative to anti-anxiety drugs and sleeping pills. Rochester, Vermont: Park Street Press. ix, 166p. ISBN 0892816406.

Kilham,C. 1996. Kava: medicine hunting in paradise: the pursuit of natural alternatives to anti-anxiety drugs and sleeping pills. Rochester, Vermont: Park Street Press, 166p. ISBN 0892816406.

Lebot,V., Merlin, M. & Lindstrom, L. 1992. Kava: the Pacific drug. New Haven: Yale University Press, vii, 255p. ISBN 0300052138.

Singh,Y.N. 1992. Kava: an overview. Journal of Ethnopharmacology 37(1): 13-45.

WWF funds crocodile survey

From Max Kuduk: Source: The National Newspaper, Monday 8 November, 1999, By Ruth Konia

The annual Sepik River Crocodile Monitoring Survey by the Department of Environment and Conservation was made possible, thanks to the assistance of a non-government organization. World Wide Fund for Nature (WWF) provided K61,000 as part of a tripartite agreement between the East Sepik provincial government, WWF and the Office of Environment and Conservation (OEC) that conducted the survey, between November 1-3, at selected spots along the Sepik catchment in the Ambunti district. According to OEC, the survey, which began in 1981, has been an integral part of their work on a yearly basis to establish a carefully controlled sustained yield harvesting program for crocodiles in PNG. The OEC has reported that the main approach in monitoring the population in PNG has been through studies of crocodile nesting, because mound nests of freshwater and saltwater crocodiles are clearly visible from the air and are frequently known to local hunters. The OEC is a party to the Convention on International Trade of Endangered Species of Wild Flora

and Fauna (CITES) and is required to provide a biannual report to Crocodile Specialist Group (CSG) on the crocodile population trends in the country. However, in 1997 and '98, the surveys were not carried out as a result of inadequate budget allocation to OEC and the significant increase in survey costs, especially the helicopter hire. Due to limitation of funds, OEC has not been able to carry out the surveys on other river breeding sources like the Fly River, where such vital data could also be recorded. WWF, through it's Sepik Community Land Care Project, has taken the initiative to support the efforts of OEC to control and regulate the use of this resource, which will assist the development of a long-term conservation program for crocodiles. WWF expects to continue working with OEC to conduct surveys and analysis of such data in the future. The survey will also make the local crocodile skin industry aware of the wild population, which is being harvested for commercial purposes, while at the same time trying to avoid over harvesting.

The Papua New Guinea Eco-Forestry Forum

From Timothy King, Coordinator of PNG Eco-Forestry Forum

The PNG Eco-Forestry Forum is an organisation formed in April 1999 by leading non-government and other organisations in PNG that support environment conservation and community development through practical eco-forestry initiatives.

The purpose of the Eco-Forestry Forum is to support the activities of its members and other groups involved in eco-forestry and to promote their work to a wider audience. Specific activities that the Forum is involved in include:

- Facilitating the sharing of knowledge, experience, news and information between members and other groups

- Representing the views and supporting the interests of its members and promoting the advantages of eco-forestry to a wider audience
- Facilitating the production and exchange of common training, education and awareness materials and working with its members to improve staff training and development opportunities
- Facilitating collaboration between community groups engaged in eco-forestry activities and to develop programmes to add value to timber at a local and district level

and to support initiatives with non-timber forest products

- Co-ordinating the production of a national Eco-Forestry strategy
- Supporting the development of certified forestry

The Eco-Forestry Forum is registered as an incorporated association, has a board of directors and a full time co-ordinator.

Membership of the Eco-Forestry Forum is open to all those who support the development of a viable and sustainable eco-forestry sector in PNG. Membership costs range from K 1,000 for international profit making organisations to K 25 for individuals living in PNG. The current members of the PNG Eco-Forestry Forum include:

Diocese of Aitape Conservation Program, European Union - Islands Region Environmental and Community Development Programme, Farmset Limited, Foundation for People and Community Development, Greenpeace Pacific, Narapela Wei, Pacific Heritage Foundation, Village Development Trust, The Nature Conservancy, and WWF-South Pacific.

The Eco-Forestry Forum produces a free quarterly newsletter, Iko-Forestri Nius, which is available on application, together with a number of information leaflets.

The PNG Eco-Forestry Forum has core-funding support from The MacArthur Foundation and receives additional funding support from Voluntary Service Overseas.

The Eco-Forestry Forum can be contacted at P.O. Box 590, Kimbe, West New Britain Province, Tel: 983 5464 Fax: 983 5852, Email: teff@global.net.pg

Current Research Updates



If you have recently finished work or are currently doing a project, please send a summary for inclusion in the next newsletter--**thanks!** Remember that research articles should still be submitted to journals for publication. We just want to print a summary of your work to let people know what is going on without having to wait for the lag-time involved in regular journal publications and so that summaries of all current work in NG can be found in one location. We want to make it easy for everyone to keep informed about all of the current research in New Guinea, so please send your information!

Deer (*Cervus timorensis*) on Rumberpon Island, Manokwari, Irian Jaya

From Freddy Pattiselanno

Rumberpon Island is located on the north coast of Cenderawasih Bay National Marine Park. Deer are wild animals which are hunted by people on Rumberpon Island as a source of animal protein and family income. However, for the ecosystem to remain in equilibrium, a management plan needs to be developed to control hunting methods, to set up a restricted area for hunting, and to document and restrict the number of hunted deer.

We focused our research on the deer population and their habitat conditions in relation to food. We also tried to learn more about peoples' perceptions regarding deer conservation and the government policy which states that deer are protected wild animals.

Our results show that the population consists of 662 deer, with a greater number in the north than in the south area

of Rumberpon Island. Sex ratio was 1:3 male to female deer, and the population structure was an opposite pyramid based on age or growth period. The major habitat was natural pasture which was encircled by forest. Vegetation in the pasture included: *Cyperus* sp., *Melastoma malabathrica*, *Dacrydium* sp., *Oldenlandia* sp., *Stachytarpetta jamaicensis*, *Glicheria linearis*, *Imperata cylindrica*, *Themeda arguens* and *Cyperus rotundus*. The last three species were eaten by the deer. Generally, the people we spoke with agreed to support the effort for deer protection through prohibiting gun use and by restricting the area used for hunting.

Sponsorship from the Collaboration Unit of UPNG, UniTech and UNCEN is gratefully acknowledged.

Nesting Characteristics of the Duskey Megapode (*Megapodius freycinet* Gaimard): Some notes from a trip to Rumberpon Island

From Freddy Pattiselanno

The area of Vogelkop Peninsula belongs to the West Papuan Mountains Endemic Bird Area (EBA) in the administrative district of Manokwari. Approximately 20 bird species occurring in this EBA have restricted ranges because they are hunted and/or are threatened by forest clearance for agriculture or for roads being built and so they have lost their nesting beaches. Duskey Megapodes (*Megapodius freycinet* Gaimard) are one of nine megapode species and are restricted to Indonesia.

Megapodes are well known as Maleo (the local name used for megapodes in Sulawesi, the Moluccas and Irian Jaya). Argeloo (1997) stated that Megapodes are characterized by their peculiar breeding strategy, because their eggs are

incubated through alternative heat sources such as the sun, volcanic activity, or heat produced by rotting vegetation.

During our trip to Rumberpon Island, we found several locations used by Duskey Megapodes to build their nests. We took notes on nesting characteristics to serve as baseline data for a preservation and reproduction attempt.

- Nests were located on the land surface \pm 20 meters above sea level. Nests were 1.78 to 2 meters high and were 4 to 6 meters in diameter.
- Nest building material consisted of soil, wood plate, small rocks, leaf and branches.

- Vegetation growing around the nests included: *Ficus*, *Chisocheton*, *Ropoblaste*, *Gonocarium*, *Cryptoria*, *Haplolobus*, and *Syzygium*.
- Temperature at the nest ranged from 25 to 35° C with a humidity of 75-85%.

Sponsorship from the Collaboration Unit of UPNG, UniTech and UNCEN is gratefully acknowledged.

The Parataxonomist Training Center opens in Madang

The Center is an independent, non-profit organization, affiliated with the PNG National Museum and Art Gallery and closely collaborating with the University of PNG and the University of Technology. The Center is devoted to training Papua New Guineans as parataxonomists, facilitating their collaboration with various biological research projects in Papua New Guinea, and to developing their educational and nature conservation awareness programs, targeting grassroots audiences.

Who are the parataxonomists

The traditional, encyclopedic knowledge of the natural world by grassroots Papua New Guineans can be developed into skills which are crucial to biological research and nature conservation. This can be achieved by training talented young village people, typically with 6 to 10 years of formal education, as parataxonomists. The term "parataxonomist" was coined by Dan Janzen as a parallel to "paramedic" (Janzen et al. 1993). Para is a Greek prefix meaning in this context "in a secondary or accessory capacity", which characterizes precisely the position of the parataxonomists, as they work independently and understand the broader context of their research work, but yet do not have the same expertise as professional researchers do. The parataxonomists truly stand "at the side" of taxonomists (and other biologists), as also implied by the name.

The expertise of parataxonomists lies in collecting, mounting, pre-sorting and computer databasing of biological specimens, as well as performing field and laboratory experiments and observations and becoming qualified field assistants in biodiversity surveys. Their work results in first rate material which can be deposited in national collections and be available for taxonomic studies, as well as in valuable ecological data collected for the specimens. Further, they learn how to record the field-collected information into computer databases and document plant and animal specimens by taking both conventional and digital pictures. The activities of parataxonomists in education and nature conservation awareness on the grassroots level is another important part of their work. They can design and produce educational materials, using computers and desk-top publishing. Crucially, the parataxonomist are trained to develop the ability to detect, analyse and articulate environmental problems and often become much more effective communicators on the village and primary school level than most of the scientists. In summary, parataxonomists can become an important link between professional biologists and grassroots villagers, two groups who often find it difficult to communicate and understand each other.

Activities of the Center

The newly opened Center continues parataxonomist projects which have been on-going since 1994. Its parataxonomist programmes follow the footsteps of the National Institute of Biodiversity in Costa Rica (INBio) (Janzen et al., 1993) and of the parataxonomist training developed in PNG by Larry Orsak at the Christensen Research Institute between 1993 and 1997. With its nine

parataxonomists, the Center represents one of the most extensive parataxonomist projects, alongside such programs as INBio and ALAS (Arthropods of La Selva) in Costa Rica.

New Guinea is home to exceptionally high endemic biological diversity. It is beyond dispute that one of the priorities of both academic and applied research in New Guinea is documenting this high biodiversity. Parataxonomists can greatly facilitate biological research in PNG, which is an important prerequisite in both preserving and benefiting from the wealth of biodiversity in the country. For instance, the parataxonomists of the Center produced an extensive database, including ecological data and images of over 1,000 species of herbivorous insects feeding on rainforest trees in Madang area, as well as a variety of ecological data on over 60 species of rainforest trees from the same area (Novotny et al. 1999b). Further, the parataxonomist training represents direct transfer of knowledge and experience from researchers to Papua New Guineans, enabling their active participation in research (e.g., Dal & Basset 1996, Novotny et al. 1999a). This experience is then translated by parataxonomists into their own projects, such as presentations in community schools, newspaper articles, posters, or booklets on such subjects as the traditional use of plants and insects (Auga et al. 1988, Boen 1999, Kasbal, in manuscript).

We anticipate that scientists of both developing and developed countries will rely increasingly in the future on parataxonomists to carry out small-scale ecological and taxonomic projects in rainforest and other tropical habitats, rather than mega-projects often difficult to fund and manage. Training parataxonomists for such assistance can thus be seen as an important element of in-country capacity building, contributing to the research activities within the country. For instance, the parataxonomists of the Center participated in six research projects in 1999, assisting researchers from Papua New Guinea, Australia, USA and the Czech Republic.

The Center is currently sponsored mainly by the National Science Foundation (USA), as well as by grants from the PNG Biological Foundation and the Czech Academy of Sciences. The funding for the operational expenses of the Center, as well as for a variety of training, research, educational and nature conservation awareness projects is being sought for the year 2000 and beyond. In addition to grants for specific projects, it is envisaged that an important part of the budget should be raised by the parataxonomists, by assisting various research projects in PNG.

Detailed information on the Center is available at <http://www.entu.cas.cz/png/index.html> Information on the research projects assisted by parataxonomists is presented at <http://www.bishop.hawaii.org/bishop/natsci/ng/ngecol.html>

References

- Auga, J., Boen, W. K., Dal, C. D., Manumbor, M. I. & Molem, K. S. 1998. The importance of leaf chewing insects in the lowland rainforest of Papua New Guinea. *The New Guinea Tropical Ecology and Biodiversity Digest* 5, 5-6.

- Boen, W. K. 1999. PNG bai stap olsem wanem bihain taim? *Wantok*, 20 May 1999, p. 28.
- Dal, C. & Basset, Y. (1996) Leaf chewing insects feeding on figs (*Ficus* spp.) in the Madang area: methods and faunal composition [abstract]. *Science in New Guinea* **21**, 141
- Janzen, D. H., Hallwachs, W., Jimenez, J and Gamez, R. (1993) The role of the parataxonomists, inventory managers, and taxonomists in Costa Rica's national biodiversity inventory. In *Biodiversity Prospecting: Using Generic Resources for Sustainable Development* (eds W. V. Reid, S. A. Laird, C. A. Meyer, R. Gamez, A. Sittenfeld, D. H. Janzen, M. A. Gollin, and C. Juma), pp. 223-254. World Resources Institute, Washington.
- Kasbal, M. (in manuscript) Edible plants (bush tucker) in Baitabag village.
- Novotny, V., Basset, Y., Auga, J., Boen, W., Dal, C., Drozd, P., Kasbal, M., Isua, B., Kutil, R., Manumbor, M. and Molem, K. (1999a) Predation risk for herbivorous insects on tropical vegetation: a search for enemy-free space and time. *Australian Journal of Ecology*, in press.
- Novotny, V., Basset, Y. & Miller, S. E. (1999b). Herbivorous insects feeding on rainforest trees in the lowlands near Madang, Papua New Guinea. Published at <http://www.bishop.hawaii.org/bishop/natsci/ng/ngecol.html>

Contact :

The Parataxonomist Training Center, PO Box 604, Madang, Papua New Guinea; ph/fax +675 852 1587, e-mail binatangi@datec.com.pg, www site <http://www.entu.cas.cz/png/index.html>. Director: Vojtech Novotny, Parataxonomists: John Auga, William Boen, Chris Dal, Samuel Hiuk, Brus Isua, Martin Kasbal, Richard Kutil, Markus Manumbor and Kenneth Molem.

Sea Turtle Project

My name is Kiki Dethmers and I have been conducting a PhD study on a sea turtle population in SE Maluku since early 1996. I am attached to the Department of Environmental Studies of the Nijmegen University, my project is sponsored through the UNPATTI in Ambon. At present I am still waiting to be able to go to Aru again to finalise my

field work which has suffered a major delay through the ongoing riots in Ambon and other part of Maluku.

Any one wishing to correspond with me can do so via: Kiki Dethmers, Marine Turtle Aru Research Project c/o WWF-Wallacea, Jl. Hayam Wuruk 179, Denpasar 80235, Bali, Indonesia, Tel/Fax: 0361 247125, Email: Kikid@sci.kun.nl

Conservation of the Leatherback Turtle Population in the Bird's Head Region of Papua, Indonesia: A Challenge

From Ricardo F. Tapilatu, Ph.D student at James Cook University, Australia

Significance

The Leatherback turtle, *Dermochelys coriacea*, is a highly pelagic and cosmopolitan turtle, which can be found in tropical and temperate oceans of the world (Carr 1952). Leatherbacks usually nest in colonies in the tropics between (latitudes) 30° N and 20° S (Starbird et al. 1992). Leatherbacks worldwide may be divided into two major populations: the Atlantic population and the Pacific population (Marquez 1990). The Leatherback nesting grounds in the India ocean have declined and appear to be extinct now (Spotila et al. 1996). The most important nesting ground for the Atlantic population is found in the eastern part of French Guiana and western Suriname (Hoekert et al. 1996). Major rookeries for the Pacific population are found on the Pacific coast of Mexico (Pritchard 1982), Terengganu (Malaysia) (Limpus 1995, Chan and Liew 1996), and on the Bird's Head of Irian Jaya, Indonesia (Salm et al. 1982, Bakarbesy et al. 1999).

The leatherback is an endangered species with many populations declining, and they have disappeared from many historical nesting areas (Paladino et al. 1999). The Terengganu colony has collapsed in recent years (Chua 1988, Limpus 1995, Chan and Liew 1996) and this has also happened to the Mexican Pacific population (Pritchard 1997). On the other hand, the leatherback population in Bird's Head of Irian Jaya appears to be reasonably secure and shows an increase in the number of nests of around 55% between 1993-1996 (Nababan and Bakarbesy 1996). Thus, Bird's Head rookeries provide a nesting ground for one of the few remaining large populations of leatherbacks in the world. It cannot be denied that this region is not only of local, but also international importance and that it should rank among the major conservation areas in the world. Nevertheless, latest

information available suggests the population appears to be in decline due to intensive pressures recently (Bakarbesy et al. 1999).

Decreases in the numbers of nesting leatherbacks are often linked to anthropogenic causes (Ross 1982). The serious decline in the leatherback population on Mexican beaches is a result of the combination of beach slaughter, egg collection, and serious incidental captures by fishing gear (Pritchard 1997). Terengganu's colony has declined by as much as 98% due to continued over-exploitation of eggs by people, incidental captures by fishing gear, tourism related activities and marine pollution (Chan and Liew 1996). Similarly, in the north of the Bird's Head coast of Irian Jaya, leatherback nests laid are lost due to beach erosion, predation by wild pigs and feral dogs, and the collecting of eggs by local inhabitants (Starbird and Suarez 1994, Bakarbesy et al. 1999). It seems that disturbance to this stock is typical. Therefore, conservation action should be implemented properly to avoid more devastating declines occurring to this population in this area to secure the sustainable population of Pacific leatherback and directly contribute to the leatherback population worldwide. Consequently, a solid strategic plan for management of the rookeries is necessary. An interdisciplinary approach combining biological and social aspects is necessary to create an effective conservation and management plan for leatherback turtles in this region.

Background

Sea turtle populations in many areas throughout the world are threatened. For this reason and other reasons, all species of sea turtle are protected. Internationally, the International Union for the Conservation of Nature and Natural Resources (IUCN) has classified all species of marine

turtle as endangered or critically endangered. The Convention on International Trade in Endangered Species of wild fauna and flora (CITES) lists all marine turtles on its Appendix I, which prohibits trade in turtle products. Likewise, five species of sea turtle occurring in Indonesian waters (Suwelo 1971, Suwelo et al. 1982): leatherback (*Dermochelys coriacea*), green turtle (*Chelonia mydas*), loggerhead (*Caretta caretta*), olive-ridley (*Lepidochelys imbricata*) and hawksbill (*Eretmochelys imbricata*) have been protected by Indonesian law through Presidential decrees (Siswomartono 1996). Indonesia has been also a party to the CITES which lists the five turtle species in Appendix I. Admittedly, although several laws were issued, their enforcement has not been successfully achieved since sea turtle populations in Indonesia continue to decline.

Worldwide, ecological, reproductive, and growth studies on leatherbacks, the species focus of this study, have been conducted to provide insight into life history patterns. The following summary of life history traits is based partly on studies outside of the western Pacific region. Breeding appears to occur principally between May to September (Nababan and Bakarbesy 1996). An average of the five nestings per season per female has been documented with an inter-nesting interval of around nine days (Eckert 1987, Tucker and Frazer 1991, Boulon et al. 1996). The mean number of eggs per clutch was 109, the number of mean yolked eggs was 86 and the yolkless egg number was 23 (Lessil 1999). Eggs hatch after 65 days and hatching success can attain 100% in an undisturbed nest. The hatchling production and pivotal temperature for this stock has not been quantified. Hatchling sex ratio varies between rookeries and should be a function of beach temperature. This species has the highest juvenile growth rate of all sea turtle species, and reaches sexual maturity on average in around 13 to 14 years (Rhodin 1985, Zue and Parham 1996). The distribution of adult males, immatures and adult females after the nesting period is unknown and demographic data are unavailable for this stage.

The leatherback population is declining (Pritchard 1997) as a result of numerous factors. These include factors associated with human activities such as fishing operations, coastal development, pollution, harvesting of females and eggs, and boat traffic (National Research Council (NRC) 1990); and natural factors such as beach erosion, inundation, and predation (Bhaskar 1985, Suarez and Starbird 1996). The Pacific leatherback population faces threats typical of other nesting populations especially poaching of eggs for subsistence, harvesting of nesting females for meat, pig and feral dog predation.

In Indonesia, there is a low density of leatherback nests in western Sumatra, and in southeastern Java (Polunin and Nuijta 1982). Over 80% of leatherback nests occur on the north Bird's Head coast of Irian Jaya (Suarez and Starbird 1996), where each nesting season both nesting females and eggs face a multitude of problems. Eggs laid are lost due to beach erosion, predation by wild pigs and feral dogs, and poaching by local inhabitants (Bhaskar 1985, Bakarbesy 1993, Starbird and Suarez 1994). Loss of eggs due to beach erosion has not been well quantified. Likewise, nest predation and collecting of eggs appears to be severe with at least half or more of all clutches being destroyed and taken. Some adult females are also taken while nesting on the beaches. This also happens to the leatherbacks in Papua New Guinea (Spring

1982) and islands in Pacific oceans. Therefore, it can be concluded that eggs and adult female leatherbacks are the most critical stages for the leatherback survival in the western Pacific.

The Directorate of Forest Protection and Natural Conservation (PHPA), and the Department of Forestry and World Wildlife Fund for Nature (WWF) are the agencies responsible for managing nesting beaches in the Bird's Head region (Nababan and Bakarbesy 1996). However, the PHPA and WWF are not equipped to take on the management of a large area. With the present staffing, PHPA is not in a position to do the enormous amount of work that has to be done for a highly complex marine area; this would be far beyond the capacity of PHPA. Consequently, only Jamursba-Medi has been consistently protected and documented, even though nesting activity has been reported from Sausapor in Sorong to Wibain in Manokwari (Adipati and Patay 1983, Bawole et al. 1994). It is believed that a significant number of leatherback nesting might occur in these rookeries making an essential contribution to the population. The current decline in other Pacific and Indian ocean populations should raise strong concerns for the future of the Bird's Head population. Since each colony of leatherback is thought to form a part of a single interbreeding population, comprehensive management of this endangered species can not be successfully conducted unless complete information is available.

The focus of conservation of reproducing leatherback turtles can be divided into two general categories: protection of animals and protection of their habitat. It is rather obvious that the important nesting areas, nesting activities, as well as the eggs and hatchlings should be protected. Eggs and hatchlings even though they have a lower reproductive value than juvenile and adults, are important to secure the sustainability and recovery of a sea turtle population. It is very well known that intensive egg harvesting will make it very difficult or impossible for the sea turtle population to be sustained (Heppel 1997), because it hampers recruitment of a new generation. Therefore, eggs and hatchlings must be conserved and should be considered as a planning tool of sea turtle conservation (Crouse et al. 1987). It is expected that nest protection is important to compensate for the mortality of adult leatherbacks. Two successful attempts at protecting eggs and hatchlings were made with the Kemp's Ridley population in Mexico, where the population declining was slowed to only 3-4% during the 1980's (Heppel 1997), and with the hawksbill population in the Seychelles (Mortimer 1999). In addition, a simulation model developed by Spotila et al. (1996) suggests that nest protection may have a significant effect on the stability of leatherback population.

Ways to conserve the sea turtle population by protecting eggs and hatchlings can be achieved through the head starting program, hatchery, and beach protection. Ehrenfeld (1982) concluded that the best that can be done is to emphasize the importance of protecting the remaining population, using the simplest and least risky conservation techniques. One of the simplest is protection of nesting habitats, supplemented by a variety of practices. The effectiveness of this technique depends on the attitude of local communities and their traditional use of the resource. Hence, the social sciences have emerged as a potential partner to conservation (Machlis 1995) and seem poised for important incorporation. In many cases, conservation action did not

account for the potential advantages of including social science information and thus eventually failed to attain the conservation goal (Mc Neely 1995). Therefore, it is important to enable the social sciences to be integrated with biological sciences as an integral part of conservation to enable local communities in developing bottom-up conservation strategy.

Conservation Focus

The north part of the Bird's Head region of Papua Papua is one of the world's major nesting grounds for the leatherback turtle. Conservation depends on the assessment of the local problems. The most important factor to nest survival in this area are natural factors: inundation and erosion; biological factors: predation by pigs and dogs; and socio-economic factors: collecting of eggs by humans (Bakarbesy 1993). These three factors jointly destroy a large number of leatherback nests.

This north coast region is fringed by the Pacific Ocean which is continuously rough between October to April. A large number of eggs deposited each year is lost by sea inundation and wave wash (Bhaskar 1985). In addition, the introduction of wild pigs onto this big island is one of the important factors affecting the survival of the nests (Bhaskar 1985, Bakarbesy 1993). On the other hand, this Indonesian nesting habitat may be the last remaining major population in the western Pacific and is becoming important to the survival of this species worldwide.

The Bird's Head coast of Papua belongs to two districts, the Sorong district on the west and the Manokwari district on the east. This region comprises two sub-districts and seven coast villages. Around 2,500 people representing a diverse racial mix, with Papuan ancestry predominating, now inhabit this region. Around this region and other coastal regions of Irian Jaya, people rely on the sea as a major source of protein from fish, turtles, and mollusks (UNDP/FAO 1982). Sea resources are used to provide money and food without any regulation. Turtles are still being hunted for daily consumption, and all species are utilized including the leatherback. However, the levels of harvesting and egg collection are unknown and have not been quantified. Therefore, although the leatherback population in this region is one of the most substantive in the world today, it is not as good as the evidence suggests. It has become apparent that the conservation of leatherback population would require the formulation of a long-term strategy and collaborative effort of various sectors including indigenous people to implement it.

The Decline of leatherback turtle population in this region is aggravated by the existence of poverty in this area and limited alternative income, lack of public awareness, lack of law enforcement and the pressure on the natural resources for food (Environmental Study Centre - Cenderawasih University = ESC-CU 1998) which triggers sea turtle exploitation, thus influencing the population. Therefore, a focus of conservation is to evaluate the threats faced by this population and to overcome the problems by designing appropriate conservation planning. It is important that biological and social aspects are incorporated to overcome this threat, so that the sustainability of leatherback turtle population can be a reality. Five questions arise:

1. Where do the leatherbacks nest in Bird's Head coastal region of Papua, and how significant are these sites?
2. What is the current status of leatherback nesting population?

3. How many eggs and hatchlings are produced?
4. What are the significant biological and social factors affecting this population?
5. To what extent do planning strategies address the issues of biological factors, and what are seen to be the major influences on the condition of the leatherback population?
6. What planning strategies are necessary to address the socio-economic and cultural factors that are already known to influence leatherback resource use?

Reference List

- Adipati E and Patay M (1983) Laporan penelitian penyu laut dan tempat bersarangnya di daerah Kepala Burung Propinsi Irian Jaya 17p (Unpublished report)
- Bakarbesy J (1993) Laporan perkembangan kegiatan dan pengawasan cagar alam pantai Jamursba-Medi. World Wildlife Fund/PHPA (unpublished report)
- Bakarbesy J, Suarez A, Dutton PH (1999) In press Leatherback (*Dermochelys coriacea*) nesting on the north Vogelkop coast of Irian Jaya, Indonesia. In Proceedings of the 2nd ASEAN Symposium and Workshop on Sea Turtle Biology and Conservation. (Eds Pilcher N and Ismail G).
- Bawole R, Tapilatu RF, Sala R (1994) Bioekologi beberapa jenis penyu di pantai utara Manokwari 42p (Unpublished report).
- Bhaskar S (1985) Management and research of marine turtle nesting sites on the Vogelkop coast of Irian Jaya, Indonesia. EEF/IUCN Publication 27pp
- Boulon RH, Dutton PH and Mc Donald DL (1996) Leatherback turtles (*Dermochelys coriacea*) on St. Croix, U.S. Virgin Islands: Fifteen Years of Conservation. *Chelonian Conservation and Biology* 2(2):141-147.
- Carr AF Jr (1952) Handbook of turtles. Cornell University Press, Ithaca, New York.
- Chan EH and Liew HC (1996) Decline of the leatherback population in Terengganu, Malaysia, 1956-1995. *Chelonian Conservation and Biology* 2(2):196-203.
- Chua TH (1988) Nesting population and frequency of visits in *Dermochelys coriacea* in Malaysia. *Herpetology* 22:197-207.
- Crouse DT, Crowder LB and Caswell (1987) A stage-based population model for loggerhead sea turtles and implications for conservation. *Ecology* 68:1412-1423.
- Eckert KL (1987) Environmental unpredictability and leatherback sea turtle (*Dermochelys coriacea*) nest loss. *Herpetologica* 43:315-323.
- Ehrenfeld D (1982) Options and limitations in the conservation of sea turtles. In *Biology and Conservation of Sea Turtles*, Proceedings of the World Conference on Sea Turtle Conservation Washington DC, 26-30 November 1979 (ed KA Bjorndal), Smithsonian Press Washington DC, pp 457-463.
- Environmental Study Centre - Cenderawasih University (1998) Evaluation study of the Protection areas in Sorong district. Report to Forestry agency of Irian Jaya Province. 265p.
- Heppel SS (1997) On the importance of eggs. *Marine Turtle Newsletter* 76:6-8.
- Hoekert WEJ, Schouten AD, Van Tienen LHG, Weijerman M (1996) Is the Surinam olive ridley on the eve of extinction? First census data for olive ridleys, green

- turtles and leatherback since 1989. *Marine Turtle Newsletter* 75:1-3.
- Lessil N (1999) Hubungan ukuran karapas dengan jumlah telur penyu belimbing (*Dermochelys coriacea*) di Kawasan Cagar Alam Pantai Jamursba-Medi, Kabupaten Sorong. Unpublished B.Sc thesis. Faculty of Agriculture-Cenderawasih University. 83p.
- Limpus CJ (1995) Global overview of the status of marine turtles: a 1995 viewpoint. In *Biology and Conservation of Sea Turtles, Proceedings of the World Conference on Sea Turtle Conservation* Washington DC, 26-30 November 1979 (ed KA Bjorndal), Smithsonian Press Washington DC, pp 605-609.
- Machlis GE (1995) Social science and protected area management. In *Expanding Partnerships in Conservation*. (ed JA McNeely) Island Press. Washington DC, pp 45-57.
- Marquez MR (1990) An annotated and illustrated catalogue of sea turtle species known to date. FAO Fisheries Synopsis No. 125 (11), FAO Rome. 81p.
- Mc Neely JA (1995) Partnership for conservation: An Introduction. In *Expanding Partnerships in Conservation*. (ed JA McNeely) Island Press. Washington DC, pp 1-10.
- Mortimer JA (1999) In press. Conservation of Hawksbill turtles (*Eretmochelys imbricata*) in the Republic of Seychelles. In *Proceedings of the 2nd ASEAN Symposium and Workshop on Sea Turtle Biology and Conservation*. (Eds Pilcher N and Ismail G).
- Nababan MG, Bakarbessy J (1996) Kondisi penyu belimbing (*Dermochelys coriacea*) dan suaka mergasatwa pantai Jamursba-Medi serta masa depan pengelolaannya. Sub Balai KSDA, Irian Jaya, Sorong. Unpublished report 14p.
- National Research Council (1990) *Decline of the Sea Turtle: Causes and Prevention*. Washington DC: National Academic Press. 259p.
- Paladino FV, Spotila JR and Reina R (1999) Las Baulas Leatherback Turtle Project. [on line] Available : http://www.coas.drexel.edu/enviro...ica/Las_Baulas/Project/Index.html. 08 August 1999.
- Polunin NVC and Nuijta NS (1982) Sea turtle populations of Indonesia and Thailand. In *Biology and Conservation of Sea Turtles, Proceedings of the World Conference on Sea Turtle Conservation* Washington DC, 26-30 November 1979 (ed KA Bjorndal), Smithsonian Press Washington DC, pp 353-362
- Pritchard PCH (1982) Nesting of the leatherback turtle in Pacific Mexico, with a new estimate of the world population status. *Copeia* 4:741-747
- Pritchard PCH (1997) Evolution, phylogeny, and current status. In *The Biology of Sea Turtles*. (eds Lutz PL and Musick JA). CRC Press Inc, pp 1-28.
- Rhodin AGJ (1985) Comparative chondro-osseous development and growth of marine turtles. *Copeia* 4:752-771.
- Ross JP (1982) Historical decline of loggerhead, ridley, and leatherback sea turtles. In *Biology and Conservation of Sea Turtles, Proceedings of the World Conference on Sea Turtle Conservation* Washington DC, 26-30 November 1979 (ed KA Bjorndal), Smithsonian Press Washington DC, pp 189-195.
- Salm RV, Petocz R and Soebartono T (1982) Survey of coastal areas in Irian Jaya. UNDP/FAO/WWF, FO/INS/78/061, Special Report, Bogor.
- Siswomartono D (1997) Status of marine turtles in Indonesia. In: *Proceedings of the Workshop on Marine Turtle Research and Management in Indonesia* (Eds Noor, YR, Lubis IR, Ounsted R, Troeng S, and Abdullah A). Jember University, East Java. pp 93-98.
- Spotila JR, Dunham AE, Leslie AJ, Steyermark AC, Plotkin PT and Paladino FV (1996). Worldwide population decline of *Dermochelys coriacea* : Are leatherback turtles going extinct? *Chelonian Conservation and Biology* 2(2):209-222.
- Spring CS (1982) Subsistence hunting of marine turtles in Papua New Guinea. In *Biology and Conservation of Sea Turtles, Proceedings of the World Conference on Sea Turtle Conservation* Washington DC, 26-30 November 1979 (ed KA Bjorndal), Smithsonian Press Washington DC, pp 291-295.
- Stancyk SE, Talbert OR, Dean JM (1980) Nesting activity of the loggerhead turtle *Caretta caretta* in South Carolina, II. Protection of nests from raccoon predation by transplantation. *Biological Conservation* 18:289-298.
- Starbird CH, Baldrige A, Harvey JT (1992) Seasonal occurrence of leatherback sea turtles (*Dermochelys coriacea*) in the Monterey Bay region. In *Proceedings of the Twelfth Annual Workshop on Sea Turtle Biology and Conservation* (compilers JI Richardson and TH Richardson), National Oceanic and Atmospheric Administration Technical Memorandum NMFS-SEFSC-361, pp 242-245.
- Starbird CH and Suarez A (1994) Leatherback sea turtle nesting on the north Vogelkop coast of Irian Jaya. In *Proceedings of the Fourteenth Annual Symposium on Sea Turtle Biology and Conservation* (compilers Bjorndal KA) NOAA Technical Memorandum NMFS-SEFSC, pp 143-146.
- Suarez A and Starbird CH (1996) Subsistence hunting of leatherback turtles, *Dermochelys coriacea* in the Kai Islands, Indonesia. *Chelonian Conservation and Biology* 2(2):190-195.
- Suwelo IS (1971) Sea turtles in Indonesia. In *Marine Turtles*, IUCN Publ. New Series, 31 Morges Switzerland, pp 85-89
- Suwelo IS, Nuijta NS and Soetrisno I (1982) Marine turtles in Indonesia. In *Biology and Conservation of Sea Turtles, Proceedings of the World Conference on Sea Turtle Conservation* Washington DC, 26-30 November 1979 (ed KA Bjorndal), Smithsonian Press Washington DC, pp 349-351.
- Tucker AD and Frazer NB (1991) Reproductive variation in leatherback turtles, *Dermochelys coriacea*, at Culebra National Wildlife Refuge, Puerto Rico. *Herpetologica* 47:115-124.
- UNDP/FAO (1982) Survey wilayah perairan pantai Irian Jaya. National Parks Development Project INS/78/061. Field report. 62p.
- Zug GR and Parham JF (1996) Age and growth in Leatherback turtles, *Dermochelys coriacea* (Testudines : Dermochelyidae): A skletochronological analysis. *Chelonian Conservation and Biology* 2(2):244-250.

Effects of Aqueous Neem and *Melia azedarach* Extracts on the Early Development of *Eurema blanda* (Lepidoptera: Pieridae)¹

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Aqueous Neem and *Melia azedarach* seed extracts were applied on the eggs of *Eurema blanda*. The effects on the egg and early larval development were assessed and compared with the effects of the commercial Neem product Neem Azal-T/S. All treatments resulted in a significantly

lower survival rate of the larvae than of the control larvae treated with water only. 100% mortality was reached 6 to 7 days after the treatment with Neem seed extracts and Neem Azal-T/S. The treatment with *Melia* seed extracts took 14 days to kill 100% of the caterpillars.

Observations on the Aggregation Behaviour of *Arcte coerulea* Guenée (Lepidoptera: Noctuidae)

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A peculiar aggregation behaviour of the Noctuidae moth *Arcte coerulea* was observed under a residential house on the campus of the Bulolo University College, at Bulolo (7° south, 147° east, 700 m. a. s. l., mean annual temperature of 24.3° C, mean annual rainfall of 1513 mm), Morobe Province, Papua New Guinea during October and November 1997, when the area was severely affected by a prolonged drought caused by El Niño.

This aggregation started with a few individuals and boomed to several thousand individuals during the course of about four weeks. Initially a few adults were attracted to the light of a fluorescent lamp where they gathered and subsequently increased in number. The apparently nocturnal adults did not leave their roosting place during day and only a few moths of the aggregate were observed flying around during night.

The fast-flying moths occasionally bumped into obstacles during flight, particularly after being confused by light or upon disturbance. In the latter case the moths additionally squeezed out the contents of the rectum. The fruit-loving adults could often be encountered on ripe fruits such as bananas and pawpaw.

During the climax of the aggregation, the females laid their eggs all over the ceiling, including the wings of other moths. After the hatch the caterpillars were suspended from the ceiling under the house on silken threads looking like a thick curtain. The small larvae remained under the house since they were not drifted away by wind.

The increasing number of dead rotting adults and caterpillars were releasing an unpleasant stench. An additional nuisance were the faeces so that the adults finally were dispersed mechanically by the help of twigs. After this remedy the adults did not return.

Biological Control of the Termite Pest *Coptotermes elisae* (Isoptera: Rhinotermitidae) with an Ant of the Genus *Pheidole* (Hymenoptera: Formicidae)

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One of the most destructive pests of Hoop and Klinkii pine plantations in Papua New Guinea is the termite *Coptotermes elisae* (Isoptera: Rhinotermitidae). Our endeavour to search for organisms suitable to control this termite lead to an ant of the genus *Pheidole*. Initially, these animals seemed to be the perfect candidates due to their large numbers that could cope with the large number of termites in a colony. Furthermore, the small size of the ant that allowed them to intrude into the termite galleries and additionally the ants' greed in grabbing termites were very promising to successfully control *Coptotermes*. After some days the ants

eventually stopped killing any more termites probably because the termite stock in the ant nest was already filled up. Interesting however was the method of trapping the ants so that the whole colony could be carried to a termite-infested area. A hollow banana 'stem' was baited with sugar and closed at both sides with fine gauze to prevent other insects like cockroaches stealing the sugar. The trap was then placed next to where the ants had established their colony and covered with leaves to create moist conditions suiting the ants. After some days the whole ant colony had moved into the trap and was ready for transport.

Did you know? Two new additions to the list of already known New Guinea Mammals

From Rose Singadan

Did you know that we can now add two new mammals to the list of those already known from the island of New Guinea? Although the people of the Bensbach area in the far southwest region of the Gulf of Papua knew these animals existed there, science did not. Dr. G. Hitchcock (see mailing directory for contact information) deposited these mammals into the collections of the Resource Center at UPNG as part of his research work. It is not a secret but we were

kind of waiting for the wallaby to grow up before we made him known to the public. He came here as a joey, almost out of the pouch when his mother was killed by hunters and eaten. The false water rat, *Xeromys myoides*, was donated to us as a skull specimen by Dr. Hitchcock. In all the places that it could have been found, imagine the only known skull specimen of this species on New Guinea was found at the bottom of a toilet pit. Thanks to Dr. Hitchcock it was recovered from there,

otherwise it would have gone unnoticed for another 100 years. They are both kept here at the Resource Center in Port Moresby.

The hare wallaby, *Lagorchestes conspicillatus* (known as the Spectacled Hare wallaby because of the prominent orange/brown ring around its eyes) and the false water rat or mangrove rat (as it is known in the Lower Fly region), *Xeromys myoides*, were already known from

Australia, but not from New Guinea. *Lagorchestes conspicillatus* live in open forests and grasslands in Queensland and the Northern Territory, and similarly, this wallaby lives in open forests and savanna woodlands from Morehead across to the Bensbach area in the Western Province of PNG. The false water rat likes living in the mud and therefore prefers swamps and mangroves. That is why the locals in the Lower Fly area call this rat the "mangrove rat".

Display Behavior of the Magnificent Bird of Paradise: A Pilot Study from the Crater Mountain Biological Station

from Ed Scholes, Division of Ornithology, The University of Kansas Natural History Museum and Biodiversity Research Center, Lawrence, Kansas 66044 USA escholes@ukans.edu

During August through November 1999, I had the opportunity to investigate the courtship display behavior of the Magnificent Bird of Paradise (*Cicinnurus magnificus*) in Papua New Guinea. The project was a pilot study intended to facilitate future research on bird of paradise display behavior and evolution as a part of my doctoral degree in ecology and evolutionary biology. The fieldwork was conducted at the Crater Mountain Biological Station within the Crater Mountain Wildlife Management Area. The station is an excellent facility for researchers interested in the flora and fauna that occurs in the intersection between the lowlands and the highlands in what is usually referred to as "hill forest." This region receives its name from the steep topography that characterizes the land between the flat lowlands and the mountainous highlands. Elevation ranges from 850 to 1250 meters in the study area surrounding the field station.

The Magnificent Bird of Paradise is a common inhabitant of hill forest throughout New Guinea and is quite abundant in the forest surrounding the field station. Like most birds of paradise, the Magnificent is extremely sexually dimorphic with adult males exhibiting brightly colored ornamental plumage and females that are drably colored and somewhat nondescript. Unlike most birds of paradise, the adult males perform their elaborate courtship displays on patches of ground that have been cleared of forest debris. These display courts vary in size and form, but are typically several meters squared and can be a conspicuous element of the forest floor along steep slopes in areas where adult males are common.

The main objective of this study was to make detailed observations of population variability in various aspects of male courtship display behavior. These aspects included display court size, court parameters (slope, number of display perches, etc), vocalization rates, vocalization context, and the nature and degree of individual variation in components of display behavior and display repertoire. Several previous researchers (Seth-Smith 1923, Rand 1940, and Coates 1990) have provided descriptions of Magnificent Bird of Paradise display behaviors, however these descriptions were based on the observation of only a few individuals. Thus, current

knowledge of Magnificent Bird of Paradise courtship displays in the literature is limited to general descriptions of the major elements of display with little reference to display rates and degrees of variation between individuals. Until this study, no attempt has been made to describe aspects of display behavior based on repeated observations of multiple males within a single wild population.

Details of methodology and results of this research are to be published elsewhere, and should include valuable information concerning the seasonality of courtship display behavior, rates of courtside vocalizations, detailed descriptions of display courts, and a discussion of courtship display behavior.

This pilot study was generously sponsored by a field assistantship from the Wildlife Conservation Society. I owe eternal thanks to the WCS Papua New Guinea Country Program Coordinators: Drs. Andy Mack and Deb Wright. Without their support, my trip simply would not have been possible. Additional sponsorship came from a teaching assistantship for the 1999 Cristensen Biological Training Course in Papua New Guinea. The staff of the Research and Conservation Foundation of PNG deserve special thanks for their valuable assistance and logistical support while I was working in the Crater Mountain WMA. Finally, without the permission and assistance of the landowners of the Crater Mountain WMA, none of the fieldwork would have been possible. I thank them for permission to do research on their land and for their dedication to the Crater Mountain Project.

Literature Cited

- Coates, B. J. 1990. The birds of Papua New Guinea including the Bismark Archipelago and Bougainville. Vol. 2. Dove, Alderley.
- Rand, A. L. 1940. Results of the Archbold Expeditions. No. 26. Breeding habits of the birds of paradise, *Macgregoria* and *Diphyllodes*. American Museum Novitates, 1073, 1-14.
- Seth-Smith, D. 1923. On the display of the Magnificent Bird of Paradise *Diphyllodes magnifica hunsteinii*. Proceedings of the Zoological Society of London, 1923, 609-13.

A Long Term Insect Collecting Programme begins in the Lakekamu Basin

From Stuart Serawe, Conservation Officer at Foundation for People and Community Development

A long-term insect-collecting programme has begun in the Lakekamu Basin ICAD Project Area by the Silvaard Institute of Natural History of the USA. The Institute's director, Mr. Terry Sears, personally visited the Ivimka Research Station to kick-start the new programme, while at the same time to test a new light trap he invented himself. He

was ably assisted by two other renowned American entomologists, Dr. Steve Heydon, a senior scientist with the University of California's Bohart Museum, and Dr. Nathan Schiff, a research scientist engaged by the US Department of Agriculture's Forest Service.

Mr. Sears spent four weeks collecting moths and other insects of interest, while Drs. Schiff and Heydon spent two weeks conducting their respective research and assisting him. Dr. Heydon was researching various forest-dwelling species of parasitic hymenoptera, especially pteromalidae wasps. These wasps lay their eggs inside or on the bodies of other insects, which then consume the host during the course of their development. Dr. Schiff was investigating the species of sawflies occurring in New Guinea.

Mr. Sear's light traps were tried in the field for the first time ever, and worked so marvelously at the Ivimka Research Station that he has made these the core of his long-term insect collecting programme. He engaged and trained at least twenty local assistants in assembling the traps, selecting strategic spots for maximum harvests, and sorting and pinning the insect specimens for the Silvaard Institute of Natural History. He selected seven individuals as the core of these locally trained field officers and rightly named the group the "Binatang Brigade". Its membership will grow as the programme increases its insect-collecting activities in the near future.

What is so unique about harvesting the insect fauna is that their populations are barely affected. Almost all insects are able to mate and lay their eggs on the spot immediately after they emerge from their pupae, which helps to explain the fact that insects are the most dominant group of organisms on the earth today. They by far surpass all other terrestrial

organisms in numbers, and they occur practically everywhere. In short, when anyone talks about insects, they are talking about biodiversity, with or without knowing it.

The Foundation for People and Community Development (FPCD) and Conservation International-PNG's field officers are delighted about the new insect-collecting programme in the Lakekamu Basin, as it is the first long-term project since the ICAD initiative began there five years ago. Though the facilities at Ivimka are of a world standard, there has not been any long-term programme in place until this one began in November 1999.

With the start of this programme, the confidence of the local inhabitants in the work of FPCD and CI-PNG, the two counterparts in the Lakekamu Basin conservation and development project, has been boosted. It will be a good opportunity for the people to earn some cash from one form of non-timber forest product, apart from the butterfly farms already established by the Wau Ecology Institute, and the betelnut trade at markets outside the Basin.

Other scientists intending to visit the Ivimka Research Station and the Lakekamu Basin can contact FPCD or CI-PNG for more information. At FPCD contact Katherine Yuave, Tom Pringel or Stuart Serawe phone: (675) 325-8470, fax: (675) 325-2670, email: fpd@datec.com.pg. At CI-PNG contact Banak Gamui phone: (675) 323-1532, fax: (675) 325-4234. Brochures and tourist guides are available and can be obtained from FPCD.

Research on Human Hunting of Wildlife

From Richard Cuthbert

Dr. Richard Cuthbert is planning to commence a research project on the impact of human hunting on wildlife populations in PNG. This project aims to gather data on the nature and extent of hunting, and to determine the primary use of hunted species (meat or traditional decoration and ornamentation) and its main destination (subsistence use or markets). Future research will concentrate on key threatened species, and will aim to determine the impact of hunting on a community scale by investigating species abundance in areas of differing hunting intensity.

I am planning to visit PNG for 4-5 months commencing in July 2000. The purpose of this initial trip will be to gather preliminary data on what species are hunted and the use and occurrence of species in markets and for

subsistence use.

In addition I want to determine the suitability of various research sites for more detailed surveys.

At this stage I am interested in any information on hunting in PNG, for example data on what species are hunted; the frequency of hunting; uses of hunted species; areas, villages, and towns where bushmeat or animal products are sold; anecdotal records of declines in hunted species; and any suggestions on the best way to go about such a project.

If any one has any such information, then I would be very interested to hear from you. I am most easily contacted via e-mail at : richcuth@xoommail.com or else by post: Dr. Richard Cuthbert, 50 Grove Lane, Holt, Norfolk, NR25 6ED, UK.

Cospeciation and Host Shifts in New Guinean Rainforest Fig Wasps

From Carlos Lopez Vaamonde of the NERC Centre for Population Biology

With 750 or more species, *Ficus* (Urticales: Moraceae) is one of the most speciose genera of all terrestrial plants with greatest diversity in Australasia where 500 species occur. Fig trees are considered to be keystone species in tropical ecosystems. Aseasonality and inter-tree asynchrony of fig production provides a continual supply of food for frugivorous birds, bats and monkeys through periods when there is a seasonal dearth of other fruits. Since each species of fig tree is pollinated by its own unique species of fig wasp (Hymenoptera: Agaoninae), an understanding of this complex obligate mutualism is critical for the future conservation and management of tropical rainforests.

Since 1996, I have studied the evolution of fig wasps associated with Australian *Ficus* species in the subgeneric section *Malvanthera* (Corner). These fig species are endemic

to Australia, New Guinea and some Melanesian islands. Most are typical strangler rainforest species. They are pollinated by different species of wasp from the genus *Pleistodontes*. They are also exploited by a range of non-pollinating wasp genera. The larval ecology of two non-pollinating genera is clear - *Meselatus* species form galls in the fruits while *Megastigmus* species are parasitoids of the *Meselatus* wasps. The larval ecology of two other common genera is less well understood - both *Sycoscapter* and *Eukobelea* develop in seeds but it is not clear whether they are simple phytophages or kleptoparasites that kill the pollinator wasp larvae.

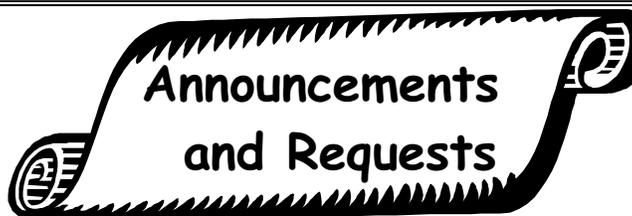
During my MSc research project I have generated molecular and morphological phylogenies of a selected set of *Pleistodontes* (pollinator) and associated *Sycoscapter* (non-pollinator) species using sequence data for the nuclear

28sRNA gene and the mitochondrial cytochrome b gene. To date I have sequences for twenty *Pleistodontes* and sixteen *Sycoscapter* species. The partial phylogenies are congruent, as expected under the co-speciation hypothesis, but more *Sycoscapter* species must be added to permit meaningful statistical tests for congruence.

I visited the East New Britain Province last year (5th March-19th March 1999). I was based at the PNG Cocoa & Coconut Research Institute and had the chance to collect data on several interesting lowland *Malvanthera* fig species but also went to the Baining Mountains where I found what might turn out to be a couple of new species of *Malvanthera* figs.

I am now working on the analysis of the data in collaboration with George Weiblen (Harvard University, USA) and Jean Yves Rasplus (INRA, France).

If you are interested in figs, check out the following web site <http://129.31.3.171/> This site is a centre for information about fig plants, fig wasps, and the people who study them. You will find an introduction to the natural history of the symbiosis of fig plants and fig wasps, along with a gallery of photographs of these fascinating organisms. Have a look at the photos I took during my visit to ENB: <http://129.31.3.171/gallery2.html>.



This section is for anyone to use. You can send in announcements (for example, to advertise an upcoming meeting). You can also send in any requests for information that you think other newsletter recipients could help with (for example, if you are writing a paper about forest structure and want to find out who is currently working in this area or who you could collaborate with or exchange info with). Please send any announcements or information requests to Deb.

Documentation of Rare Birds in PNG

From Phil Gregory

The PNG Bird Society recently decided that it would be desirable to formalize the process by which new species or major rarities are included in the avifauna of PNG. This has in the past been largely an *ad hoc* process, but it is desirable to bring it into line with many other countries, which have set up a small committee to vet records and establish a procedure for formal acceptance. This also facilitates the establishing of an archive of documentation, without which we run the risk of losing records or having a very random process of acceptance. We have followed the established rarity form template used by the Birds Australia Rarities Committee, whom we thank for permission to adapt the form now available.

We aim to be as transparent as possible with the process, it should be a simple matter to write up the sighting and let the committee vote on acceptance or otherwise. We are happy to give reasons for acceptance or non-acceptance to the persons involved, and to publish details of additions to the avifauna, of which there is now something of a backlog.

The following have kindly agreed to form the initial committee, but expressions of interest from suitable persons who wish to be involved are also of interest.

K. David Bishop: One of the top PNG bird experts and a professional tour leader with vast experience there and with great knowledge of the avifauna.

Ian Burrows: Former professor of Biology at UPNG, with much experience of the country and its birds.

Brian Coates: Another of the top PNG bird experts, Brian is the author of the classic 2 volume standard avifauna *The Birds of PNG*.

Chris Eastwood: Experienced birder and longtime PNG resident, author of numerous notes and papers about his bird trips there.

Phil Gregory: Editor of *Muruk* and professional bird trip leader with much PNG experience, longtime resident of Tabubil in Western Province. Interim Secretary of PNGBS Rare Birds Committee, from whom rarity forms are available.

Please forward all correspondence and records to: Secretary, PNGBS Rarities Committee, P. O. Box 387, Kuranda, Queensland 4872.

E-mail : sicklebill@internetnorth.com.au

Provisional list of requested species for which the committee would like to receive details:

- Any species not yet formally accepted onto the PNG list (see Beehler 1985 and Coates 1986 and 1990)
 - Any species with less than 5 recorded occurrences, or which is not recorded annually in PNG territory or territorial waters.
 - Rarely reported and very little known resident species.
- Please write to the address above for a list of rare species already recorded, claimed, or pending possible acceptance.

PNG Bird Society Newsletters

From Phil Gregory

The Society is regrettably no longer able to publish a Newsletter, ending a tradition that began back in 1965, due to the lack of in-country observers. The final issue was Number 291.

Fortunately however, Meg Cameron, the editor of *Australian Birding Magazine*, is keen to have a Papua New

Guinea link and publishes a useful round-up of PNG news in each issue. It also often has articles of interest about birding in Papua New Guinea. The magazine is published 4 times a year with subscriptions costing A\$30 within Australia, or US\$ 30 / GBP 15 if overseas airmail. They may be obtained from Andrew Isles Natural History Books, 113-115 Greville St,

Prahran, Victoria 3181. E-mail aislesbs@anzaab.com.au, Fax (61) 03 9529 1256.

Chris Eastwood has recently scanned the newsletters of the Papua New Guinea Bird Society into Microsoft Word 97. This covers all newsletters, from the first (not surprisingly issue no. 1) which was issued in December 1965 to the last newsletter, issue no. 291, which was issued in December 1997. Included with the newsletters are at least 90% of all the illustrations and diagrams that were produced (the only exceptions have been certain illustrations which have been too faint to scan properly or which were repetitive and a few that were unrelated to PNG birds). A handful of articles, not relating to birds, have similarly not been reproduced. Some of the illustrations and diagrams have had to be retouched to improve reproduction.

In scanning the newsletters, Chris tried to be faithful to the original style and appearance of the newsletters although for convenience he adopted a standard font (Times New Roman) and reproduced everything in A4 format (in contrast to the earlier newsletters which were on foolscap). This has meant, inevitably, that the pagination of the Word 97 version is not the same as the originals.

Chris also tried to be faithful to the exact text of the originals but, with the benefit of modern technology (and spellcheckers), has corrected minor typographical errors. He also "corrected" the spelling of Latin and place names where these varied from current practice so as to allow for easier searches. He did not, however, correct the English and Latin names of birds, even though many of these have since changed. This means that if someone wishes to search for all references to a particular species, they will have to use a variety of alternative names.

He also prepared a list of contents covering all the newsletters (by reference to the issue number only, not the specific pages) and has drawn up an index (based on the list of contents).

A copy of all these files can be saved on to a CD for anyone who is interested. A floppy disc copy is not feasible as some of the files are too large. If you would like to receive a copy please send Chris A\$20 to cover the cost of a CD and airmail postage. The address is Chris Eastwood, PO Box 484, Port Moresby. If you would like further information you can e-mail Chris on chbe@daltron.com.pg



The Parataxonomist Training Center in Madang

offers assistance to biological research projects in Papua New Guinea

The Center has the staff of nine experienced parataxonomists who can provide assistance to a variety of biological research and conservation projects. In particular, we offer:

- *Field assistance in expedition-type biological research, including biodiversity surveys in any part of Papua New Guinea.*

This assistance includes collecting data and specimens, as well as logistic assistance and facilitation of contacts with local landowners and villagers. The parataxonomists can join any expedition as qualified field assistants with little need for additional training, and with excellent knowledge of local situation and organization of biological expeditions in difficult conditions and remote areas of PNG.

- *Collection of biological data and material according to specific protocols.*

The parataxonomists can sample various groups of organisms, particularly arthropods and plants, in any habitat and area of PNG, following quantitative sampling protocols (such as pitfall, malaise, light, litter, sticky, intercept etc. traps, canopy fogging, plant surveys in permanent plots etc.), as well as sampling qualitatively for faunistic and other surveys. They can also carry out long-term, continuous data collecting in the field, e.g. on the population dynamics of various species, on insect herbivory, plant phenology, etc.

- *Preparation and documentation of biological specimens for museum collections and databasing of research data*
- Parataxonomists can prepare museum-quality insect and plant specimens, mount, label and database them using various database software. For insects, pre-sorting of material to morphospecies is also possible, including, in some groups,

pre-sorting based on genital morphological characters. Further, the specimens can be photographically documented, including digital photography.

- *Field assistance in nature conservation and community development projects*

Parataxonomists are experienced in assisting nature conservation and awareness programs on grassroots, village level.

The Center can provide assistance to field biological research in any part of PNG, with parataxonomists either joining the collaborating research team in the field or organizing field trips themselves. This assistance can be particularly effective around Madang, where the Center is located. Regrettably, the Center cannot provide any accommodation or laboratory space to visiting scientists.

The Center will collaborate only with projects which have all necessary national, provincial and landowner permits. Any biological material can be collected and exported only after the necessary permits have been obtained and voucher specimens deposited at appropriate PNG institutions. The Center does not supply any biological specimens intended for further commercial sale.

If you think the Center can be of any assistance to your project, do not hesitate to contact us. Visit also our www site for more detailed information:

<http://www.entu.cas.cz/png/index.html>

Contact Address:

Dr Vojtech Novotny, Parataxonomist Training Center
P. O. Box 604, Madang, Papua New Guinea,
Ph/fax +675 852 1587, E-mail binatangi@datec.com.pg
<http://www.entu.cas.cz/png/index.html>

Wanted: Information about animals eating figs

I am a PhD student studying fig-eating and seed dispersal by birds and mammals. As part of my thesis I am compiling a global review of fig-eating records. To date I have data on frugivory for 250 Ficus species and records of fig-eating for over 700 bird species in 285 genera. I am seeking additional records of fig-eating by birds and mammals from the Oriental region and wonder if anyone reading this

newsletter has unpublished records or can point me in the direction of obscure publications that may be of interest.

Naturally, any help you can provide will be fully acknowledged should a publication arise from this project. Please contact: Mike Shanahan, Centre for Biodiversity & Conservation, University of Leeds, Leeds LS2 9JT, UK, Email: mikeshanahan@yahoo.com

Seeking Images of Bird of Paradise Display Behavior

For a portion of my doctoral research, I am working on a systematic study of the evolution of Bird of Paradise courtship display behavior. This project involves the analysis of courtship display behavior from all species in the family Paradisaeidae. Some of the most valuable data available come from photographs, video, or other images of displaying birds. At present, I am in the initial stages of collecting as many images of bird of paradise display behavior as possible. If anyone out there has photographs, video, film, drawings or even detailed descriptions of bird of paradise display behavior that they would like to contribute to my research please

contact me at the address below. All images will be used for the purpose of scientific research ONLY and will not be reproduced, distributed, or used in any profit-making venture. Any persons contributing images to published research will be appropriately acknowledged in any resultant publications. Thank you for your help. Please contact: Ed Scholes, Division of Ornithology, Natural History Museum and Biodiversity Research Center, Dyche Hall, The University of Kansas, Lawrence, Kansas 66045-2454 USA, Office Phone: (1) 785-864-3369, Division Phone: (1) 785-864-3657, Fax: (1) 785-864-5335, Email: escholes@ukans.edu

Wanted: Information on Sea Turtle Conservation Projects

Could anybody provide me with examples of successful community based conservation or co-management programmes of sea turtles. I would be interested in all kinds of CBC projects but particularly those in areas where there is no tourism, where communities have been hunting turtles for generations and where turtle trade is a lucrative business.

- What was the incentive that made people change from consumption to conservation?
- How are the communities involved (in the decision making or in the implementation or both)?

- What are the mechanisms (limited catch, no take zones, closed seasons etc.)?
- Who controls these mechanisms?
- Why is the programme a success (what is used to measure this success)?

Please respond to my personal email address, kikid@sci.kun.nl

Thanks a lot in advance, Kiki Dethmers, Marine Turtle Aru Research Project, Email: Kikid@sci.kun.nl, c/o WWF-Wallacea, Jl. Hayam Wuruk 179, Denpasar 80235, Bali, Indonesia, Tel/Fax: 0361 - 247125

Insects in the Jayawijaya Mountains of Irian Jaya

I am planning to conduct a research project which is supposed to start at the beginning of 2001. This project will focus on insects in the mountain ecosystems of the Jayawijaya mountains in Irian Jaya, Indonesia. Right now I am trying to find partners who would be interested in this enterprise. Of course I am especially interested in contacts in Irian Jaya itself, but I am also looking for interested partners in the whole of Indonesia and specialists who have worked there or still do work there.

I have already contacted UNCEN, and some other people in Indonesian Universities who are involved in the HEP (higher education) programme. I have also contacted the Indonesian Ministries of Environment and Forestry.

I want to conduct a one-year project with the insect communities in the Alpine region of the Jayawijaya mountains of Irian Jaya, Indonesia. I intend to finance this with a national grant from Austria. What I need is the invitation of an Indonesian research institution, which confirms that the

project is conducted under the advisory supervision of this institution. The cooperating institute gets an independently working post-doc for free and will be credited for the (informal) invitation by co-authorship on every publication of the results of the project.

Certainly this short message is not capable of resolving all questions in detail, but a full description would be too long. So, if anybody has additional information on whom to contact in order to succeed with this project or is interested in this project himself, I would really appreciate if he/she would contact me.

Thank you very much for your interest: Mag. Dr. Thomas Moertelmaier, c/o Institute of Zoology, University of Salzburg, Hellbrunnerstr. 34, A-5020 SALZBURG, AUSTRIA, Phone & Fax (43) 664-211-3134, Email: syrphtom@wst.edvz.sbg.ac.at Homepage: <http://www.edvz.sbg.ac.at/~syrphtom/syrphtom.htm>

Torresian (Pied) Imperial Pigeon Alert

From Joan Bentrupperbaumer

A major biological event is unfolding with the pigeons on North Brook Island, and the team (Margaret Thorsborne, Dave Green, myself and volunteers) running the

census counts on the island is seeking information, ideas and help as to why this is happening.

This year's early October afternoon flight census (the first for the season) has detected a dramatic drop in numbers

arriving to nest on the island to date.

11 Oct 99	1,600
12 Oct 98	29,000
11 Oct 97	28,940
5 Oct 96	25,338
7 Oct 95	15,221

The pigeons usually start to arrive in late August and steadily increase in numbers over the following months. They nest on the island and make daily flights to the mainland to feed on rainforest fruits.

1. Are the pigeons merely late in arriving from New Guinea this year? We hope this is the case.
2. Have the pigeons moved from the Brook Islands to some other breeding locality? This seems most unlikely, but it would be good to know what is happening on nearby islands.
3. Is there a dramatic decline in pigeon numbers? If so what has caused the decline: a major fruiting failure in New Guinea,

Needed: Information on Nest Predation

I am an Indonesian studying for a PhD at the Northern Territory University in Australia. I am going to research the role of nest predation in the reproductive ecology of birds. I am considering doing part of my research in Irian Jaya (Indonesian New Guinea). If you are aware of any similar kind of research on nest predation in Irian or in Papua New

climatic events, disease or what?

4. If there has been a major decline in numbers, is this reflected in other aspects of rainforest bio-dynamics?

Queensland Parks and Wildlife Service is checking to see if there has been a comparable drop in October counts at Green Island and the Low Isles where rangers take census counts from time to time. They will also alert the staff who visit the Franklin and Barnard island groups.

If you have any information which would contribute to solving this mystery or can help in any other way, please let me know. There may be some limited funding available through the Thorsborne Trust to help in finding an answer. As rainforest ecologists, we should be able to find the answer!

Please contact: John Winter, Massey Creek Ecology Centre (MCEC), P.O. BOX 151, Ravenshoe, Queensland 4872, Australia, Phone & Fax (61) 07 4097 6503, e-mail: jwinter@internetnorth.com.au

Needed: Information on Walking Catfish

The Walking Catfish (*Clarias batrachus*) was recorded for the first time in the Fly River system in 1995. However, there is not much known about the species in terms of its biology and ecology. I am carrying out a project on its diet in the Fly River system but I need additional information on its origins, biology and such. By using the added information and the dietary studies to be carried out, I will be

Guinea, could you please inform me? Thank you for your help.

Please contact: Yeni A. Mulyani, Faculty of Science, Info Tech and Education, Northern Territory University Bld 42, Darwin 0909 Australia, phone: (61) 8-8946-6814, fax: (61) 8-8946-6847, email: y_mulyani@site.ntu.edu.au

Needed: Information on Orchids in Irian Jaya

I am looking for information on the biogeography or phytogeography of orchids in the Radja ampat Archipelago of Sorong, Irian Jaya. Any information on this particular topic would be greatly appreciated.

able to compare with the native aquafauna and determine *C. batrachus*' impact on native aquafauna.

Please contact: Joice Taufa via email: taufa.joyce.jt@bhp.com.au or fax: (675) 548 9390 or postal address: c/o Environment Department, OTML, PO Box 1, Tabubil, Western Province. Papua New Guinea.

CI-Asia Pacific Staff Awarded Netherlands' Order of Golden Ark

Dr. Jatna Supriatna and Gaikovina Kula-- directors of CI's Indonesia and Papua New Guinea (PNG) programs, respectively-- are the latest recipients of the prestigious Netherlands' Order of the Golden Ark. The honor was bestowed in November 1999 by Netherlands' Prince Bernhard.

Established in 1971, this award recognizes the achievements of the world's most distinguished conservationists. Past recipients include Dr. Richard Leakey, Sir David Attenborough and CI President Russell A. Mittermeier.

Dr. Supriatna, an internationally renowned primatologist and scholar, joined CI in 1995. In two decades of conservation, he has published six books and 70 scientific articles in the field of primatology and other disciplines. At

CI, Supriatna led Indonesia's first conservation priority-setting workshop devoted to the province of Irian Jaya and promoted conservation of the unique Togeian Islands of Central Sulawesi through conservation-oriented ecotourism and spatial planning.

Gaikovina Kula started his 20-year conservation career as a provincial wildlife officer in PNG. Today, the World Bank, United Nations Development Program and many other organizations seek his advice on environmental issues. Since he joined CI in 1996, Kula has drawn much-needed attention to PNG's exquisite marine environments and contributed immeasurably to biological knowledge of this little-explored region of the world through two CI Rapid Assessment Program expeditions.

BioLink Software for Taxon and Specimen Data Management

From BioLink E-Newsletter No. 3. 29 March 2000

The BioLink team is happy to announce that the final test version of BioLink (Beta 3), The Biodiversity Information

Management System, is now available. This version incorporates suggestions received from testers of previous

BioLink releases. BioLink now includes a broad range of tools to manage taxon- and specimen-based information. These tools are aimed at both taxonomists and collection managers and include extensive query and reporting tools. The Report Editor allows user-defined reports to be produced ranging in complexity from simple checklists to complete monographs. Importing from existing data sources has been improved with support for Excel, Access and DBF files in addition to delimited text files, and the handling of suspicious records has been enhanced. Exporting has also been improved with support for text files, XML, Excel, Word, RTF and Access. We have also added a Database Utilities program to assist with creating, deleting, backing up, restoring, shrinking and upgrading BioLink databases. This version of BioLink also includes an essentially complete on-line help system.

Release Schedule, Prerequisites and Costs

BioLink requires a Pentium-based PC running Windows 95/98/NT4sp4/2000 and up to 300 megs of disk space (if all gazetteer files, modelling files, database engine and demonstration data are loaded). The complete BioLink package, BioLink Ver. 1.0, is scheduled to be released 1 July, 2000 (development will be completed by 1 May, giving our publisher time to prepare disks and packaging). Pricing and licensing details for corporate users are available on request from biolink@ento.csiro.au. Pricing for individual users is currently being finalised. The user's manual will be available on the BioLink web site shortly.

Obtaining a Copy of BioLink Beta 3

We have a limited number of BioLink Beta 3 CD-ROMs available for distribution at no cost. These will be distributed primarily to previous testers who have provided us with feedback. The remaining disks will be distributed to those in larger institutions (where a single copy can be passed to a number of users), to those who have requested but not yet received a copy of BioLink, and finally to testers who have received a copy of BioLink but have not provided feedback. If you would like to request a disk please email your name and postal address to biolink@ento.csiro.au. We will mail a copy directly to you if available.

More Information About BioLink

For additional details concerning BioLink see <http://www.ento.csiro.au/biolink/>. You can also contact us directly with any questions and comments at biolink@ento.csiro.au. If you would like to be added to the BioLink email mailing list please visit <http://www.ento.csiro.au/biolink/subscribe/subscribe.html>

The entire BioLink Development Team, David Baird, Natalie Barnett, Neil Fitzsimmons, Ebbe Nielsen and Steve Shattuck, would like to thank those who have provided feedback and encouragement regarding BioLink and its use. This latest release incorporates significant changes and new features, most suggested by our testers. We continue to work towards BioLink Ver. 1.0 and look forward to its release at mid-year.

FUNDING OPPORTUNITIES AND JOBS

BIRDS-- The Association of Avian Veterinarians (AAV) is accepting pre-proposals for its year 2000 granting period. The AAV awards small grants each year for projects that address the conservation needs of wild avian populations, particularly in situ conservation efforts. Grants rarely exceed US\$4000. Veterinarians, non-veterinarians and students may apply. Pre-proposals should be limited to two pages and include investigator(s) with contact information, title, amount

requested, concise statement of need and background, goals, objectives, materials and methods, project timetable (not to exceed 12 months), and budget. Six copies of the pre-proposal should be submitted by 17 April 2000 to AAV Conservation Committee, c/o AAV Central Office, P.O. Box 811720, Boca Raton, Florida 33481, USA. Use double-sided printing, minimum 12 font type, and 1" margins. Electronic applications may be sent to aavctrlofc@aol.com

TURTLES-- SOPTOM, a French association for the study and protection of tortoises and turtles worldwide, funds individuals and projects focused on chelonian conservation. Up to US\$12,000 is available for projects related to topics including conservation biology, ecology, and

education. Annual application deadline is 30 November for funding during the following year. For more information contact Barbara Livoreil, SOPTOM, BP 24, 83590 Gonfaron, France, Email: Blivoreil@aol.com

Twelve Post-doctoral Fellowships for Fieldwork on Endangered Species and One Post-graduate Fellowship for Conservation Education

The Zoological Society of San Diego announces its Millennium Field Program in Conservation Science. Twelve post-doctoral positions are available (to be filled between 2000-2002) for fieldwork on endangered species (mammals, birds, reptiles, and amphibians) and ecosystems. Projects may be carried out in any part of the world, but attention will focus on five geographical regions: Southwestern U.S.A., South America, Caribbean Islands, Pacific Islands, and China, as well as on additional areas/species of particular interest to the Society (e.g., rhinoceros species in southern Africa; primates and rainforest herpetofauna of Cameroon). It is envisaged that post-doctoral fellows will carry out field projects in collaboration with staff at the Center for Reproduction of Endangered Species (CRES) as well as with the Society's Curatorial, Veterinary and Educational Departments. The

CRES laboratories, with a total of 70 scientists and technical staff, offer expertise in the fields of Behavior, Ecology and Applied Conservation, Endocrinology, Genetics, Pathology, Reproductive Physiology, Virology/Immunology and Analytical Chemistry. Funds for travel, equipment and field expenses will be included in each fellowship. Appointments will be for three years, with the possibility of extension to five years (maximum). Newly qualified PhDs, and those with up to three years post-doctoral experience are encouraged to apply. Also available is a Conservation Education Fellowship for post-graduate students which will support the Zoological Society of San Diego's conservation and research projects through community outreach and awareness programs. Stipends will begin at \$32,700, with adjustments according to experience.

Applications, to include a CV, reprints of up to three publications and names and addresses of three referees should be addressed to: The Zoological Society of San Diego,

Department of Human Resources (Millennium Fellowship Program), Post Office Box 120551, San Diego, California 92112-0551, U.S.A.

The Conservation Enterprise Fund

The Conservation Enterprise Fund (CEF) has been started with a loan of US\$1,000,000 from the Small and Medium Enterprise (SME) program of the IFC/GEF (World Bank). Conservation International (CI) acts as the financial intermediary responsible for locating, screening, lending and monitoring all investments.

Terms

Funds are available for qualified businesses for investments between \$25,000 and \$250,000. CI has agreed to make 8 investments by September 2000, thus the average range per business will be between \$50,000 and \$150,000. Investments could take the form of debt only; or a combination of loans and equity. CI will give preference to subordinated debt arrangements in which other investors are contributing to company financing. Loan periods will be negotiated according to the financing needs of the accepted applicants. Loans will be made at or just below market rates of interest in the country of disbursement-pending an evaluation of risk. Potential investments will be screened to meet a hurdle rate of 20% internal rate of return but will take into consideration social and environmental returns as well.

Leveraging Funds for Conservation

CI seeks to redirect economic forces to support conservation in the world's richest and most threatened ecosystems-"the hotspots"-that cover less than two percent of the Earth's land surface but contain over half of its biodiversity. CI's goal is to make conservation a central and valuable part of the development strategy of the 24 countries in which we work. Developing small businesses that promote conservation is a key component of CI's approach. CI has developed community enterprises in nearly 20 countries that rely upon, but do not destroy, natural resources. These enterprises bring products, such as nuts, oils, botanical extracts, coffee, cocoa, and ecotourism, to local, national, and international markets. Their success demonstrates that local people can earn their living from biologically rich ecosystems without destroying them for short-term gain. CI's Conservation Enterprise Fund provides financing to enterprises that support biodiversity conservation in this way.

Eligibility

In order to apply to the CEF, applicants must meet the following preliminary criteria:

- * Operations in countries where CI has a presence.
- * Assets valued no greater than \$5million
- * Contribute to CI's mission
- * Adhere to the GEF's environmental criteria for biodiversity conservation: to sustainably use or conserve natural biological diversity in arid, semi-arid, coastal marine freshwater, forest or mountain ecosystems.
- * Strong management team
- * Ability to demonstrate high growth and profitability potential.

Conservation International believes that the Earth's natural heritage must be maintained if future generations are to thrive spiritually, culturally and economically. Our mission is to conserve the Earth's living heritage, our global biodiversity and to demonstrate that human societies are able to live harmoniously with nature.

Investments Profiles

Investment could be for businesses engaged in:

- * Agroforestry: Shade-grown and organic agriculture, and the preservation of crop varieties within agricultural systems.
- * EcoTourism: Lodges or other ecotourism products which link travel and low-impact tourism with community ownership in pristine areas.
- * Non-Timber Forest Products: Development and promotion of oils, nuts, fruit, plants, fibers or other natural materials sustainably harvested from non-cultivated sources.

Application Procedures

- Step 1: Contact CEF Fund Manager and complete company information sheet.
- Step 2: Fund Manager will notify company within 15 days if CI has interest in receiving an application.
- Step 3: Due Diligence begins
- Step 4: Negotiation and development of investment memo
- Step 5: Investment memo reviewed by CI's internal investment committee
- Step 6: If investment committee approves, the investment memo is reviewed by IFC and loan is approved or denied.

For more information, please contact:

Jennifer Morris, Conservation International, 2501 M Street Suite 200, Washington, DC 20036, USA, Fax: 202-331-9328, Phone: 202-973-2259, Email: j.morris@conservation.org

CONFERENCES AND MEETINGS

The New Guinea Biological Society Annual Meeting

This conference is open to anyone involved in scientific research on the island of New Guinea and is an excellent opportunity to present your work to others. The annual meeting rotates between being held in PNG and in Irian Jaya. This year it will be held at the Wau Ecology Institute (WEI), Wau, PNG. Registration is on 4 September 2000 and papers will be presented in the Somare Environmental Training Centre Facility from the 5th to the 7th of September 2000. If you wish to give a talk, your abstract should be submitted from 2 months to 3 weeks prior to the conference to allow for

scheduling. The Hostel at WEI can accommodate up to 60 people and the cost is K40 per night per person plus K23 for breakfast, lunch and dinner. An attempt is being made to cover accommodation and meal costs for conference participants, so you may not have to pay these costs.

For more information please contact Samuel Krimbu, Acting Director of Wau Ecology Institute, P.O. Box 77, Wau, Morobe Province, PNG, phone: (675) 474-6341, fax: (675) 474-6381, email: wauecology@datec.com.pg

Forest Policy for the New Millennium

The National Research Institute of Papua New Guinea (NRI) proposes to host a three-day conference on this topic from **1-3 August 2000**, on the second anniversary of the conference on the subject '**Forest Management: Where Do We Go From Here?**'

The previous conference was sponsored by the International Institute for Environment and Development (IIED), with additional financial support from the World Bank, and was intended to review the current state and future direction of forest management policy in Papua New Guinea, as part of a continuing program of work by the NRI and the IIED to promote and inform public debate on the forest policy process. The proceedings of that conference were subsequently circulated to all participants.

Like that previous meeting, the forthcoming conference aims to bring together representatives of key stakeholder groups and institutions to discuss the global context of national policy reform, the future of the national forest industry, the conservation of national forest resources, and strategies for community participation in forest management. It will also provide the occasion for disseminating the results of a number of research projects which have been undertaken by NRI staff and their associates over the past two years.

It is proposed that the first two days of the coming conference will be devoted to a series of seven plenary sessions, each of which will involve the discussion of issues arising from a specific research project or from a recent publication dealing with matters of forest policy in Papua New Guinea. As with the previous conference, each of these sessions will involve short presentations by a small panel of invited speakers, followed by general discussion from the floor. The third day will be devoted to separate workshops on each of these seven topics, with a final plenary session in the afternoon, at which workshop convenors will present a summary of these separate discussions.

Provisional titles for the seven plenary sessions are as follows:
Session 1: The Donor Community and the Melanesian Environment.

This session will take a broad view of the role of international donor agencies, especially the World Bank, AusAID and the European Union, along with a number of international environmental NGOs in shaping policies, programs and projects in the 'forestry and conservation' sector. Special consideration will be given to the 'double interaction' of donor agencies with the national government and with 'civil society', in light of a recent study on the role of the World Bank which has been commissioned by the World Resources Institute.

Session 2: Sustaining Forests and Forestry – Financial, Economic, Institutional and Political Arrangements.

This session will be devoted to the preliminary findings of a research project sponsored by the IIED, involving the NRI, the University of PNG and the University of Technology, which is concerned with 'Instruments for Sustainable Private Sector Forestry'. Discussion will focus on the role of economic incentives and institutional structures in the establishment of a more sustainable forest management regime in the private sector. Specific attention will be paid to the log export tax, proposals for an environmental levy, the assessment of landowner benefits, and the outsourcing of some of the current

functions of the National Forest Service. The political obstacles to institutional reform will also be discussed.

Session 3: Adapting the National Policy Process to Lessons Learnt in the Field.

This session will review the findings of a study undertaken by the National Research Institute as part of the second phase of the earlier research project sponsored by the IIED, which deals with 'Policy That Works for Forests and People', and is intended to test the claims of key stakeholders about those projects and policies which make a positive contribution to the goal of 'sustainable forest management'. The aim of this exercise is to develop a better understanding of the way in which the lessons of experience in the field (or in this case in the forest) can be used to produce better policies at the national level, and hence with the interface between local and national policy processes.

Session 4: Ecoforestry, Community Forestry, and the Small-Scale Timber Industry.

This session will represent a continuation of debates about the problems and prospects of those economic activities variously described as ecoforestry, community forestry, or the small-scale timber industry in a Melanesian social and political context, in light of the issues and recommendations arising from previous meetings sponsored by the Dutch church agency ICCO (Rabaul 1996), the German aid agency GTZ (Goroka 1998), and the WWF-World Bank Alliance (Madang 1999), and the further progress which has since been made with questions such as certification and attempts to turn a 'small-scale' into a 'medium-scale' industry.

Session 5: Farming Practices, Forest Management, and Biodiversity Conservation.

This session will be devoted to some of the preliminary findings of the National Research Institute's project on 'People, Land Management and Environmental Change', which is funded by the GEF through the United Nations University. While this project is primarily concerned with the maintenance of 'agrodiversity', rather than the conservation of biodiversity in rainforest habitats, the significance of this session lies primarily in the opportunity to discuss linkages between resource management issues in the forestry, conservation and agricultural sectors.

Session 6: Planning, Development and Management Options for Local Communities.

This session will examine the interface between local communities and external agencies in the negotiation of new mechanisms for securing more effective forms of community participation in the planning, development and management of forest resources. It will include consideration of the role of customary resource ownership and existing local institutions in determining the nature and extent of such participation, and specific attention will be paid to the 'development options' component of the World Bank's Forestry and Conservation Project.

Session 7: The Conservation Trust Fund and the Management of Conservation Areas.

This session will build on past discussions hosted by the Conservation Resource Centre under the GEF-funded Biodiversity Conservation and Resource Management Program in PNG, by looking specifically at the impact of newly established Conservation Trust Fund on the role of the Office of Environment and Conservation and on various non-

government organisations, both national and international, in the establishment and management of protected forest areas.

A more detailed program will be circulated to potential panellists and other conference participants once the convenors for each session have been identified. Convenors will be responsible for chairing the plenary sessions, assisting the nominated panellists to develop their own presentations, and designing the format for the workshop discussion of their chosen topic. In the meantime, all comments and enquiries

regarding individual sessions should be sent to the following members of the Conference Planning Committee:
For Sessions 1, 3, 6 and 7, contact Colin Filer (cfiler@coombs.anu.edu.au)
For Sessions 2 and 4, contact Colin Hunt (colinh@dg.com.pg)
For Session 5, contact John Sowe (jwsowe@datec.com.pg).
If you are interested in attending this conference in Port Moresby on 1-3 August 2000, please contact 'The Conference Coordinator', by email to daurpp@daltron.com.pg or by fax to the National Research Institute at (675) 326-0213.

Southern Hemisphere Ornithological Congress

27 June - 2 July 2000, Griffith University, Brisbane, Australia

URL: <http://home.vicnet.net.au/~birdsaus/index.html>

For more details see last newsletter.

Symposium topics include:

Megapodes: Past, present & future

Ratite Biology

Threatened Species Recovery Programs in the Southern Hemisphere- Are they working?

Life History and Ecology of Southern Hemisphere seabirds

Ethnosystematics and ethnobiology of birds

Shorebird migrations between the hemispheres

Biogeography and Systematics of Southern Hemisphere groups

Birds on the edge: Fragmentation and Disturbance

Mating systems and cooperative breeding

Southern Hemisphere migration: mirror image or new paradigm?

Ecology of birds in human-dominated landscapes

Seabird Conservation Issues in the Southern Hemisphere

Southern perspective on avian life histories

Physiological correlates of avian life histories

Biogeography of Southeast Asia 2000

URL: <http://nhncml.leidenuniv.nl/symposia/>

SCIENTIFIC PROGRAMME

Sunday June 4, 2000:

Welcome

Monday June 5 - Friday June 9, 2000:

METHODOLOGY

Geology: Bare rocks - full of information: Dr Tony Barber

Paleontology: Drawing information from long-dead organisms: To be confirmed

Biogeography: The quest for the right question: Dr. Fredrik Ronquist

MESOZOIC

Geology & Paleontology: Setting the stage: Dr Ian Metcalfe

Gondwana distribution: The Gondwana legacy: Dr Lynne Parenti

TERTIARY

Geology/Plate tectonics: When plates collide:

palaeogeographic scenario's : Dr Claude Rangin

Paleontology: Fossil evidence of old patterns: Dr Robert Morley

Tertiary distributions: Recent reflections of deep history events: Dr Jeremy Holloway

QUATERNARY

Geology & Climatic Change: The ever changing picture: Dr. Geoffrey Hope

Terrestrial (paleo)biogeography: To stay or not to stay, that's the question: Dr. Tim Flannery

Marine (paleo)biogeography: The Indo-Pacific Convergence - Earth's centre of marine biodiversity?: To be confirmed

Human impact : The spread of man as an ecological factor: Dr Fachroel Aziz

APPLIED BIOGEOGRAPHY

Biodiversity informatics : How to tell it others: Dr. Peter Schalk

Global Change, Societal needs & Conservation: Nurturing mankind and saving nature: Dr. Anugerah Nontji

9th Australasian Bat Conference, 2000

The Hunter Valley, NSW, 25 - 28 April 2000 URL: <http://batcall.csu.edu.au/abs/abc/conf2000>

SCIENTIFIC PROGRAMME

As this is first Bat Conference in the new millennium, we would particularly like to encourage discussion during the conference on the present state of bat biology and of the priorities for research that we should be setting for the future. It is likely that there will be a special session entitled "Ecology

and Systematics of the Bats of Tropical Australia and Papua New Guinea" and these will form an interesting contrast with the more commonly researched animals in Australia's Temperate and Sub-Tropical areas.

Information about the 9th ABC will be placed on the Web as soon as it comes to hand.

20th Annual Symposium on Sea Turtle Biology and Conservation

The Delta Orlando Resort Orlando, Florida USA
29 February - 4 March 2000

URL: <http://www.seaturtle.org/tortuga2000/eng/>

Update on 9th International Coral Reef Symposium

Website for 9th International Coral Reef Symposium <http://www.nova.edu/ocean/9icrs>

Terry Done and Anugerah Nontji, President ISRS and Chairman of the 9ICRS Organizing Committee

This note is to confirm that the Symposium will be held in Bali on 23-27 October 2000 as scheduled. We encourage all of you to attend and help make it the best Symposium yet. We welcome oral presentations and posters on any topic within the broad scope of the meeting. We also have an excellent program of mini-symposia under development (see below), but if your topic does not fit readily into one of them, it can be slotted into one of the general sessions. Abstracts should be sent to David Hopley by April 30 2000 (address details below).

Registration and Cancellation Policy

Early-bird registrations are due by July 30th 2000, payable to the conference organizers Royalindo, in Jakarta (address and payment details below). Royalindo advise that refunds for cancelled registrations will be made according to the following schedule:

Date of cancellation of registration

Amount of Refund	
Before July 30th 2000	100%
August 1st - September 30th	90%

October 1st - 15th	50%
After October 15th	0%

Field trips

At the initiative of Dr Mark Erdmann, additional pre- and post-symposium scientific field trips on live-aboard dive boats are being investigated. Please watch for the 3rd Circular for further details.

Cheaper accommodation

Cheaper accommodations are being investigated and will be announced here and in the 3rd Circular.

Dr Terry Done

Leader Sustaining Coral Reefs Project
Australian Institute of Marine Science
PMB #3 Mail Centre,
Townsville Qld 4810
Australia

Phone 61 7 47 534 344

Fax 61 7 47 725 852

email: tdone@aims.gov.au

Deep Sea Coral Symposium

An international symposium on the science and conservation of deep sea corals will be held 30 July-2 August 2000 at Dalhousie University, Halifax, Nova Scotia, Canada. The symposium also will address climatic reconstruction using corals and mapping technologies. Deadlines are 1 June for

early registration and abstracts and 30 July for final papers. For more information contact Susan Gass, Ecology Action Centre, 1568 Argyle Street, Suite 31, Halifax, Nova Scotia, B3J 2B3, Canada, Phone (902) 429-2202, Fax (902) 422-6410, Email: coral@is.dal.ca

Third International Symposium on Frugivores and Seed Dispersal

The Third International Symposium on Frugivores and Seed Dispersal, Perspectives in Conservation and Biodiversity, will be held 6-11 August 2000 in Sao Pedro, Brazil. For details contact Wesley Silva, Museu de Historia

Natural, UNICAMP, CP 6109, 13870-900 Campinas, Sao Paulo, Brazil, Email: Wesley@unicamp.br WWW <http://www.unicamp.br/ib/f2000>

Seminar on Conservation and Sustainable Utilisation of Tropical Forests in Indonesia

The Andalas University and the Forestry Faculty of Muhammadiyah University (UMSB) in Padang, West-Sumatra, Indonesia are jointly organising a Seminar on the Conservation and Sustainable Utilisation of Tropical Forests in Indonesia.

The seminar will take place around 1 September 2000 at the Campus of Andalas University in Padang.

The organising committee is inviting all researchers doing research concerning the topic of the Seminar, to present their (preliminary) findings at the Seminar. Also other interested parties (NGO's, universities, government, etc.) are invited to attend or present a paper at the Seminar.

For details and further information you can contact Nico Smith from the Faculty of Forestry (UMSB) at nasmith@bigfoot.com or cornelis@indosat.net.id

2000 Society for Conservation Biology Annual Meeting

9-12 June 2000 at the University of Montana, Missoula, Montana, USA

Current information on all aspects of the meeting can be found at <http://www.umt.edu/scb2000/>

Direct email inquiries to scb2000@selway.umt.edu

Theme of the meeting this year is "Large-Scale Conservation: Genes, Landscapes, and People"

Symposia include:

Spatial ecology and conservation

Applying Landscape ecology in biological conservation
Definitions of conservation units and multi-scale conservation planning
Regional conservation assessments of aquatic biodiversity
Role of top predators in ecological communities
Synergistic effects in fragmented landscapes
Conservation medicine: the ecological context of health
Evolutionary ecology of Pacific salmon

5th International Flora Malesiana Symposium

An announcement: The 5th International Flora Malesiana Symposium will be held in Sydney 9-14 September 2001, with prior tours and field-based workshops in tropical Queensland 2-7 September 2001. For more information visit <http://plantnet.rbgsyd.gov.au/fm/fm.html> (where you can register your interest in attending) or request first circular by

emailing fmv@rbgsyd.gov.au or writing to Dr Barry Conn, Royal Botanic Gardens Sydney, Mrs Maquaries Road, Sydney 2000, Australia - Fax 61-2-92514403.

Papers and posters on the following topics are invited:

- Systematics and Taxonomy of Malesian vascular plants
- Biogeography - both within Malesia and on relationships

with surrounding regions

- Non-vascular Plants - overviews of biodiversity and evolution of Malesian groups
 - Ecology - especially role/impact of fire in wet and dry forests; plant-fungal interactions
 - Ethnobotany
 - User and Stakeholder perspectives on Malesian plant systematics and the Flora Malesiana project - views from outside the systematics community
- Workshops** will be held in Sydney; suggested topics include:
- Malesian Plant Families - with currently active research teams
 - Malesian Plant Families - needing to be started or accelerated
 - Ethnobotany
 - Local floras
 - The Flora Malesiana Website
 - User and Stakeholder perspectives on generating and delivering biodiversity information
- Associated field-based workshops** will be held in tropical Queensland; suggested topics include:
- Training in Interactive Computer Identification Systems

- Lauraceae - systematics, biogeography and ecology
- Ethnobotany

Tours

Pre-conference tours in tropical Queensland, to wet and dry forests; mid-conference tour in the Sydney region

VENUE

The Symposium will be held at and near the Royal Botanic Gardens Sydney 9-14 September 2001

The Symposium will be preceded by associated workshops & tours in tropical Queensland 2-7 September 2001

ORGANISING COMMITTEE

Dr Barry Conn, Mr Lyn Craven, Mr Jim Croft, Dr Alistair Hay (co-chair), Dr Rogier de Kok, Prof. David Mabberley, Dr Judy West (co-chair), Dr Peter Wilson

Respond electronically at

<http://plantnet.rbgsyd.gov.au/fm/fm.html>"

Address any further enquiries to:

Barry Conn

Royal Botanic Gardens

Sydney NSW 2000

or e-mail fmv@rbgsyd.gov.au

7th International Congress of Ethnobiology

23-27 October 2000 at the University of Georgia, Athens, Georgia, USA

The International Society of Ethnobiology will hold its 7th Congress in Athens, Georgia. The theme of the Congress, symbolized by the turtle, is Earth in the next century-specifically ethnobiology's role in maintaining biocultural diversity and ensuring equitable benefits sharing and open dialogue with traditional and indigenous research collaborators. Since its founding in 1988 in Belém, Brazil, the ISE has met every two years. Subsequent congresses have been held in Kunming, China (1990), Mexico City (1992), Lucknow, India (1994), Nairobi, Kenya (1996), and Whakatane, New Zealand (1998). This is the first time that the ISE will hold its congress in the U.S. We expect a strong representation of U.S. and Canadian indigenous groups, as well as traditional peoples from Mexico, Central and Latin America, and around the world.

CALL FOR SYMPOSIA AND PAPERS

The ISE 7th Congress Planning Committee calls for symposia and/or papers on:

- . Ethnobiology of human health
- . Intellectual property rights and ethnobiological research
- . Conservation of biological and cultural diversity
- . Sustainable development of plant resources

- . Collaborative research protocols
 - . Benefits sharing and drug discovery
 - . Initiatives by indigenous, traditional, and local communities, and scientists to conserve biological diversity
- Following its traditional format, the 7th Congress will be preceded by a number of Pre-Congress Training Workshops, which focus on topics relevant to particular geographical areas or specialized interests.

WORKSHOP TOPICS

- . Prior informed consent
- . Ethnobotany and education
- . Balancing local preservation and global benefit sharing
- . People and plants: cultural perspectives on conservation
- . Ethnobiological knowledge and public health
- . Ecological change, cultural transition, and human health and other volunteered topics.

ABSTRACTS

Please send your abstracts (no more than 500 words) before March 1, 2000, by e-mail (preferred) to rstepp@uga.edu or by mail to: 7th International University of Georgia 250 Baldwin Hall Athens, GA 30602-1619

For more information please check our website at

<http://guallart.dac.uga.edu/ISE>

6th Indo-Pacific Fish Conference

URL: <http://www.seaworld.org.za/ippfc.asp>

Durban South Africa

20th-25th May 2001

First Announcement and call for papers

We cordially invite you to attend the 6th Indo-Pacific Fish Conference to be held in Durban, South Africa in 2001. Convened every four years, previous Indo-Pacific Fish Conferences have been held in Sydney, Tokyo, Wellington, Bangkok and Noumea. This will be the first time this conference has been hosted in Africa, on the shores of the western Indian Ocean.

The conference will cater for most aspects of the ichthyology of Indo-Pacific fishes (e.g. systematics, evolution, genetics, ecology, biology, behaviour and biogeography). Symposia with the usual themes of pelagic, deep-sea, chondrichthyan, larval, coastal, reef and estuarine fishes will be held. In addition, symposia or workshops on marine aquarium fishes, systematics of western Indian Ocean fishes, diversity of reproductive mechanisms in fishes, fish tagging and conservation of Indo-Pacific fish diversity by use of marine protected areas are planned.

DATES:

Registration - Sunday 20th May 2001

Conference Date - Monday 21st to Friday 25th May 2001

VENUE:

Holiday Inn Durban Elangeni Conference Centre on the Durban beachfront. This venue is in close proximity to the Oceanographic Research Institute, the host organisation for the conference.

ACCOMMODATION:

Accommodation, at special conference rates, will be available at the Holiday Inn Durban Elangeni (4 star and all rooms have a view of the Indian Ocean). Numerous other hotels and self-

catering holiday apartments are located along the Durban beachfront.

LANGUAGE: The official language of the conference will be English.

The Conference is being organised by the Oceanographic Research Institute, Durban in collaboration with the JLB Smith Institute of Ichthyology, South African Museum, Natal Sharks Board, University of Natal, Marine and Coastal Management, South African Network for Coastal and Oceanic Research and the National Research Foundation.

Molluscs 2000 - Understanding Molluscan Biodiversity in our Region into the 21st Century

URL: <http://www.austmus.gov.au/malsoc/confer3.htm>

4th - 8th December, 2000

The University of Sydney, Sydney, NSW, Australia

This is the second of the Society's 3-yearly meetings aimed at bringing together people working on molluscs in the Australasian and Indo-west Pacific regions. A major focus for the meeting will be to investigate new and improved ways of sharing and disseminating information and data throughout the region. Our objective is to have a very exciting and broad-based meeting.

As well as general papers, there will be **three main symposia:**

1. Describing Molluscan Biodiversity - taxonomy and phylogeny and their role in biodiversity studies
Scheduled for Monday the 4th December.

2. Assessing Molluscan Biodiversity - ecology, life history and genetics
Scheduled for Tuesday the 5th December.

3. Humans and Molluscan Biodiversity - impacts, commercial utilization, pests and diseases
Scheduled for Wednesday the 6th December.

Open Session - There will also be an Open Session that will accept papers on other aspects of Mollusca. Papers dealing specifically with information dissemination are particularly welcome.

The main papers for each symposium will be presented in an entire morning session (9am to 12.30pm). Additional papers will be given in the afternoon session on the day allocated to your symposium but these may have to run, at least in part, in parallel with other sessions. The Keynote Speakers for each symposium have been allocated 40 minutes (including time for discussion). Regular speakers have 20 minutes (including time for discussion). Posters will be displayed for the whole of the conference and specific times will be made available for viewing poster presentations.

Due dates
Registrations by 15th October, 2000. Registrations after that date will have a \$20 late fee imposed. Deadline for abstracts 30th October, 2000

Registration costs

\$160 students (+ \$50 for final dinner + drinks - optional)

\$250 non-student participants (+ \$70 for final dinner + drinks -optional)

There is a \$20 discount for MSA members.

Excursions

One or two one-day excursions are being planned following the meeting. More information will be provided later.

Accommodation

Limited college-style accommodation will be available at the University on a first-come, first-serve basis (this is basic accommodation, mostly single rooms, with shared bathrooms. Cost is approximately \$50 single or \$75 twin, including breakfast and tea & coffee facilities. Final costs available next year). Please indicate your requirements on the registration form. There is also a variety of hotel, motel and backpacker-style accommodation near the University. You must make arrangements for this non-university accommodation yourself.

Assistance

As we have limited resources we are unable to offer fares or other costs but discounts for students have been built into the registration costs.

CONVENORS

Dr Winston Ponder

Australian Museum, 6 College St, Sydney, NSW 2010, Australia

Phone: 61 2 9320 6120

Fax: 61 2 9320 6050

Email 1: winstonp@austmus.gov.au

Email 2: wponder@mail.usyd.edu.au

Dr M.G. Chapman

The Centre for Research on Ecological Impacts of Coastal Cities,

University of Sydney, Sydney, NSW 2006, Australia

Phone: 61 2 9351 4778

Fax: 61 2 9351 6713

Email: gee@bio.usyd.edu.au

INTERNET SITES TO CHECK OUT:

People and Rainforest

The European Community has a multi-disciplinary programme called APFT (Avenir des Peuples des Forêts Tropicales) which investigates and documents the interaction between people and rainforest environments. Information about this program and a series of short papers from its findings can be found at: <http://lucy.ukc.ac.uk/Rainforest/>

Malaria

<http://www.malaria.org>

Indonesian Coral Reefs

<http://www.reefsource.com/newsrecent.htm>

Figs and fig wasps in East New Britain

<http://129.31.3.171/gallery2.html>

Contact list of people interested in figs and fig wasps

<http://129.31.3.171/contacts.html>

Research projects on insect ecology in Papua New Guinea

<http://www.bishop.hawaii.org/bishop/natsci/ng/ngecol.html>

Also includes over 1300 images of over 900 species of herbivorous insects from NG and has extensive databases of entomological literature on NG

Parataxonomist Training Center in Papua New Guinea

<http://www.entu.cas.cz/png/index.html>

Key to the Forest Insect Pests of PNG

<http://www.travelcam.com.au/mschneider/index.html>

Web site for training in SE Asia

<http://www.mered.org.uk/patraininng>

Free Searchable Non Timber Forest Product Bibliography Online

The web based international Bibliographic database on NTFPs is a free, non-profit venture. It is now online with over 1,300 entries and has a new permanent home:

<http://www.ifcae.org/cgi-bin/ntfp/db/dbsql/db.cgi?db=bib&uid=default>

The database editorial committee is actively seeking authors to write critical reviews and abstracts for records. Details are on the website. Additionally, if you have published or know of published materials on NTFPs not in the database, please fill out a submission form online so we can add them.

Announcing the Internet's First True Ecological Portal

www.eco-portal.com

Full Text Searches of Reviewed Environmental Internet Content Ecological Enterprises proudly announces their new Eco-Portal site at < <http://www.eco-portal.com/> >. Those interested in the environment can carry out full text searches through an extensive list of reviewed environmental Internet content. This premier content has been fully indexed to make it searchable from one search screen. This goes well beyond the typical "Portal" site, composed of lists of links to sites of varying information quality. Eco-Portal searches allow you to explore the entire content of hundreds of different environmental sites at the same time--for free. Portal searches are currently available for the Best in Forest, Rainforest, Temperate Forest, Biodiversity, Water, Climate Change and Ozone Layer web sites.

Each of Eco-Portal's current 600+ indexed sites have been chosen based on their usefulness to environmentalists working to familiarize themselves with the problems, and to find solutions. The Eco-Portal works much like Yahoo, Lycos, or other search engines-- only sites have been carefully chosen for inclusion. So rather than getting millions of hits of various worth and quality when you search for "rainforests" on a major search engine, on the Eco-Portal you will get several thousand highly pertinent hits. You can extensively customize your search, and instantly jump to the pages that meet your search criteria.

Ecological Enterprises asks this of those receiving this announcement:

1. Check out the Eco-Portal, and continue to use it for your important environmental conservation work.
2. If you are a webmaster of an environment web site, add a link to <http://www.eco-portal.com/> with the description: "Eco-Portal -- Full Text Searches of Reviewed Environmental Internet Content".
3. Sites are being added daily and additional portal subjects will be rolled out periodically. Please submit sites to be added to the Eco-Portal, make suggestions regarding additional Eco-Portal topics, and give us other suggestions on how to improve usability.

Thank you for your time and concern for the environment. Glen Barry, Director, Ecological Enterprises, gbarry@students.wisc.edu

Ramsar Database Update

As part of our continuing effort to make Ramsar Contracting Parties (CPs) and Site data more accessible through presentation on the World Wide Web, I am happy to report that basic map coverage for all Asian CPs is now complete. There are, at present, approximately 100 maps of various sorts posted directly on the Graphical Profile; and there are increasing links to other external web sites with relevant maps.

For a preview of innovations concerning Indonesia, look at:

URL:

http://www.wetlands.agro.nl/ramsar/CP_map_pages/Indonesia_sites.html

Indonesia: general location of Ramsar sites.

New "Clickable" map.

Select a Ramsar site and double click on the dot. A new higher resolution map will appear in a separate window, replete with links to other web sites featuring these Ramsar sites, as well as to the relevant entry from the 1999 Directory of Wetlands of International Importance.

Scott Frazier

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Web: http://www.wetlands.agro.nl/wetl_ramsar.html

Threats to Forest Protected Areas

For full report see URL: <http://www-esd.worldbank.org/wwf/> November 1999, A Research Report from IUCN The World Conservation Union for the World Bank/WWF Alliance for Forest Conservation and Sustainable Use

Executive summary:

A survey of 10 key forest countries (China, Papua New Guinea, Russia, Tanzania, Gabon, Mexico, Vietnam, Indonesia, Brazil and Peru) showed that only 1 per cent of forest-protected areas were regarded as secure and many were already suffering from serious degradation and loss. To address this problem, a new target is suggested: Conversion of 50 million hectares of threatened and under-managed forest protected areas to effectively managed and socially responsible protected areas by the year 2005.

TROPICS Journal

Recently, Japan Society of Tropical Ecology opened its official home page. The society is publishing a journal named 'TROPICS'. The TROPICS is issued quarterly with one volume a year. It is open either to the results of original research, experimental or descriptive, or significant reviews of various aspects of tropical regions. In our home page, the abstract and book number service of the journal are available. Address is "<http://biol01.sci.osaka-cu.ac.jp/jaste/>" See you through internet!



Research Sites

This section is for contributions describing research facilities in New Guinea. If you have information about a place where researchers are welcome to come and work, please send a summary. Include the location, altitude, available facilities, logistics of getting there, and a contact name, address and fax number. Thanks!

PNG National Museum and Art Gallery

From Frank Bonaccorso

The National Museum, located next to the Parliament House in Waigani, was established at its present site in 1975. The Museum consists of five collection-oriented departments: Natural History, Anthropology, Prehistory (Archaeology), Contemporary Art, and Modern History.

The Department of Natural History is staffed by five technical staff: Paul Wanga (terrestrial vertebrates), Jim Anamiato (molluscs), Bulisa Iova (birds), Ilaiah Bigilale (amphibians and reptiles) and Frank Bonaccorso (mammals and birds, especially bats and marine mammals). The technical staff are available to consider requests for research collaboration in field work and do accept consultancy assignments.

The department's collections house about 16,000 preserved specimens including terrestrial vertebrates, marine mammals, and mollusc shells. The collections are open to any research scientist with appropriate credentials (professional employment in biological or related sciences, or for expatriate scientists, demonstration of a current research visa). Loans may be requested as long as postage is paid by the user. Most of our spirits collection is preserved in, or has been treated with, formalin. There is no current tissue collection available

for molecular biology, however, in some circumstances micro-samples of bone or hair may be taken for DNA study (justification must be in writing and addressed to the Chief Curator). The collection is not data-based on a user friendly software; however, an archaic software (Modes) does contain a listing of limited information for collections other than birds. The staff are currently investigating new database options.

The Museum does offer courtesy appointments as Research Affiliates (non-paying) after careful review of purpose and research program (apply to Chief Curator). Visiting affiliates may make use of the Museum library.

The Natural History section also displays a living animal collection of about 25 species of mammals, birds, reptiles, and fresh water fish native to PNG. It is possible to utilize the living animals for non-invasive behavioral research.

For more information contact: Dr. Frank Bonaccorso (Chief Curator) or Ilaiah Bigilale (Collections Manager), Natural History, PNG National Museum and Art Gallery, P.O. Box 5560, Boroko NCD, PNG, phone: (675) 325-5364 or 2458, fax: (675) 325-1779, email: pngmuseum@global.net.pg

The Natural Science Resource Center (NSRC) of the Biology Department of the University of Papua New Guinea

from Rose Singadan

"If there is a way better than another it is the way of Nature"

Functions and purpose:

The Natural Science Resource Center (NSRC) was established in the early 1980's by the Biological Foundation of Papua New Guinea to serve as a resource and information center for the Biology Department at the University of Papua New Guinea. It has two major Sections: the Herman Slade Wing which houses the Zoological collections, and the C.E Carr Wing which houses the Herbarium.

The Center fills two major roles within the Department. It serves as a major collection and information center for the staff and students of the Biology Department and the School of Natural and Physical Sciences. It also serves to provide teaching materials and literature resources on many different species of plants and animals from Papua New Guinea.

The Center provides a supporting role to the teaching staff when displays of specimens are required for student laboratory sessions or for individual student projects. Not only

the staff and students from the School benefit, but others from other schools can also utilise the Center for their research or individual projects.

The Herman Slade Wing: Zoology Section:

The Zoology Wing houses several collections: > 20,000 Higher Vertebrates (both dry and wet collections), > 5000 fishes, >500 Corals, plus Crustaceans, Molluscs and other marine organisms 70% of which are yet to be determined and understood. The Entomology Collections house > 500 Spiders (many species undetermined) plus orders and families from ants to Bird wing butterflies.

We also keep a few animals in the live stockyard on an adhoc basis. At the moment there are four forest wallabies, *Dorcopsis luctuosa*, a breeding pair of spotted cuscus, *Spiloglossus maculatus* and a hare wallaby, *Lagorchestus conspicillatus*, one of the very recent mammals to be found and added to the list of mammals of New Guinea (see separate article in this issue).

Use of the Zoology collections by researchers

The Zoology section also has a program where specimens are loaned to individual researchers or Institutions for taxonomic work in other parts of the world as well as within the country of PNG. We work closely with the staff at the National Museum, KilaKila Agriculture Center, Forestry Research Institute, Wau Ecology Institute and Motupore Research Institute. Our Center has liased with researchers in the American Museum of Natural History, Bishop Museum in Hawaii, Leiden University and Museum, other Universities and Museums in Australia, Zoos in America eg., the Kangaroo Conservation Center, other conservation societies eg., Aboriginal and New Guinea Singing Dog conservation Society in America. We mostly loan specimens or provide information on fauna in PNG.

Higher Vertebrate collections

These collections contain cuscuses, wallabies, tree kangaroos, sugar gliders, rats, bats, frogs, and reptiles, including poisonous snakes, seas snakes, and harmless snakes, geckos and lizards. The specimens are kept as a reference collection for teaching and research, but most importantly, as a storage house for the fauna of Papua New Guinea. Between the PNG National Museum and the collections here, we have a good reference collection of all the terrestrial vertebrates of PNG.

The vertebrate collections are both wet and dry. 98% of all the wet collections are preserved in 70% alcohol. The other two percent are preserved in 4% formalin. We can preserve animals in alcohol concentrations other than 70% but this can be done only on request eg, for tissue culture or DNA studies. The dry collections contain dry bones and study skins of animals.

These collections contain animals that are of medical importance eg, snakes that are poisonous, or those of economical importance, or those used for food. There are also specimens amongst the collections that are culturally very important.

Live Collections

We keep live collections of cuscuses, wallabies, tree kangaroos, snakes (harmless) and rats for teaching sessions and to feed the snakes that we keep. At the moment we have a colony of forest wallabies, *Dorcopsis luctiosa*, a pair of spotted cuscus, *Spilocuscus macculatus*, and a Hare wallaby, *Lagorchestus conspicillatus*,

Marine collections

The Zoology section holds a collection of marine organisms kept as dry and wet specimens. There are different species of fish and corals and other marine organisms such as mollusks, sea cucumbers, sea stars and crustaceans.

Entomology Collections

The Entomology collection holds insect collections of significant value to the Biology Department as well as the Country. In addition to general collections, we have collections of insects important in medicine or those used for food, and insects of economical and agricultural importance such as stored product pests and crop pests. We also have collections that may be used for general display or teaching with prior arrangement with the staff at the center.

The C.E Carr Wing: Herbarium Collections

The C. E. Carr herbarium is divided into 3 subsections: preparation, reference and main collection areas. The preparation room is where all materials initially come. Here they are mounted and fumigated. After they are identified using the reference collections, they are put onto shelves as voucher specimens in the main herbaria.

Currently we hold well over 20,000 specimens including all plant groups from Papua New Guinea. We also have a more comprehensive collection of specimens from the Central Province and are the only herbaria in the National Capital District. The collections consist mainly of monsoon flora, trees, vines, mangrove specimens and others that students and researchers have been interested in.

The Herbarium houses dry and wet collections. Wet specimens include seeds, flowers and fruits kept in 70% alcohol. We also have a few collections of lichens and algae.

The Herbaria also has an exchange program. Specimens are sent to other herbaria in the world in exchange for plants from their collections for reference. Some institutions we trade with include: New York Botanical Garden, Kew Botanical Garden and Herbariums in Australia eg., Northern Territory Herbarium. Sometimes specimens are sent to experts at these institutions for identification. We also work together with staff at Forestry Research Institute in Lae, PROSEA based at UNITECH and the Wau Ecology Institute.

Use of Facilities:

Students and staff from within the School of Natural and Physical Sciences as well as others at the University of Papua New Guinea utilise the Resource Center.

Visiting Researchers from all over the world also make use of the facilities, especially to look at voucher specimens or to deposit specimens that they have collected in the field. We have a small collection of literature on the flora and fauna of Papua New Guinea that anyone can consult.

Staff:

There are 7 staff members: 4 full time technicians, 2 lecturers and 1 Post Graduate student who is care-taking in the herbarium while undergoing her program. The Lecturer in Vertebrate Biology is the overall supervisor for the Zoology Center while the Lecturer in Botany is in charge of the Herbarium. The technicians are responsible for specimens, general care-taking of Center duties as well as practical sessions and assisting students in their projects.

The technical staff here are also experienced field officers and over the years have assisted researchers (both national and visiting scientists) in various field work including fish fauna surveys, biodiversity surveys, and anthropological surveys in nearly all parts of the country. We can prepare display specimens for teaching or general displays but only on request and with prior arrangement with the staff at the Center.

If you want any information regarding the flora and fauna of Papua New Guinea or want more information about the Resource Center you can contact us:

e-mail:- rose.singadan@upng.ac.pg

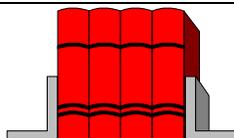
snail mail: Staff of the NSRC, Biology Department, University of PNG P.O Box 320, UNIVERSITY, Papua New Guinea.

Diseases you should know about



This section is to make sure that we are all aware of the various diseases we need to look out for in New Guinea. Many diseases you would not get in town, but only by working in the forest or in a village, and doctors might not be able to diagnose these diseases easily. If you know about a disease that we should be aware of, PLEASE send in a description, or at least the name of the disease, so we can look up information on it to include in a future issue of this newsletter—thank you! Folks at the Institute of Medical Research—can you help us?

Diseases we have covered in past issues include: Ross River Virus, Barmah Forest Virus, Filariasis, Dengue Virus, Murray Valley Encephalitis Virus, Bat Lyssavirus, Japanese Encephalitis, Malaria, Typhoid Fever and Typhus.



Available Publications and Items

If you know about any books or items we should know about, please send the details! To order the following publications, use the addresses in bold.

Free from UNDP, P. O. Box 1041, Port Moresby, NCD, PNG, fax: (675) 321-1224 or for sale from NRI, P.O. Box 5854, Boroko, NCD, PNG, Phone: (675) 326-0300, fax: (675) 326-0213, email: nri@global.net.pg

Flip van Helden, 1998. Between Cash and Conviction: The Social Context of the Bismarck-Ramu Integrated Conservation and Development Project. NRI Monograph 33. The National Research Institute and United Nations Development Programme. 302 Pages. ISBN 9980 75 091 X.

From Andrew Isles Natural History Books, 113-115 Greville Street, Prahran VIC 3181, Australia, phone: (61) 3-9510-5750, fax: (61) 3-9529-1256, email: books@AndrewIsles.com, web: <http://www.AndrewIsles.com>

Millar, Andree. 1999. Orchids of Papua New Guinea. Bathurst. 118 pages with more than 270 colour photographs. Aus\$40
O'Shea, Mark. 1996. A guide to the snakes of Papua New Guinea. Port Moresby. 239 pages with colour photographs and maps. AUS\$70

Parsons, Michael. 1998. The butterflies of Papua New Guinea: their systematics and biology. London. 736 pages with 136 colour plates; 958 species from PNG and Irian Jaya. AUS\$560

From Frank Bonaccorso, Chief Curator of Natural History, PNG National Museum and Art Gallery, P.O. Box 5560, Boroko NCD, Papua New Guinea, phone: (675) 325-5364 or 2458, fax: (675) 325-1779, email: pngmuseum@global.net.pg

Bonaccorso, F. J. 1998. Bats of Papua New Guinea. Conservation International Tropical Field Guide Series, Washington D.C. ISBN 1-881173-26-7

You can order direct from Frank for K50 which includes postage within PNG, or if outside of PNG order from University of Chicago Press for US\$35.

From William J. Sutherland, School of Biological Sciences, University of East Anglia, Norwich NR4 7TJ, England, phone: 01603 592778 or 592266 or 592269, fax: 01603 592250, email: w.sutherland@uea.ac.uk

Sutherland, William J. July 2000. The Wildlife Conservation Handbook: Research, Management and Policy Techniques. Blackwells. £16.50

As part of an innovative and excellent arrangement, it has been agreed that in lieu of royalties, Blackwells will provide one volume free to be sent to a developing country conservation biologist for each copy sold (so buy your copy now and benefit other conservationists worldwide!). Blackwells estimate sales of 3000-10,000. Please contact Dr. Sutherland directly with your nominations for free copies on: w.sutherland@uea.ac.uk. The Natural History Book Service (NHBS) has offered to coordinate sending out the free copies, and the Christensen Fund has generously agreed to pay for packaging and postage costs. You can contact the NHBS at gratis@nhbs.co.uk. It will be possible to follow the number of books donated on the NHBS web page (http://www.nhbs.com/info/sutherland/conservation_handbook.html). This page also gives further details of the book and the project to donate free copies.

Book Chapters include: Assessing biodiversity, Setting conservation priorities, Monitoring, Ecological research techniques, Problem diagnosis and prediction, Conservation planning, Organizational management and fund raising, Education and ecotourism, Bringing about political and policy changes, Species management, Habitat management, Exploitation, Integrating development and conservation

From Michael Schneider, Pfeiffermuehle 3, Wertach 87497, Germany, ph. +49 (0) 8365 – 79939, fax +49 (0) 8365 – 79951, email: michaelfschneider@t-online.de, <http://home.t-online.de/home/michaelfschneider/index.htm>

Schneider, M.F. 1999. Entomology- A Textbook for Students, Agriculturalists and Foresters in Papua New Guinea. Bulolo University College, Training Manual No. 19. ISBN 9980-85-259-3. 312 pages, 11 colour plates.

Features of this book:

- the first Entomology book produced for PNG
- addresses students as well as professionals of science, agriculture and forestry
- most examples taken from PNG's insect fauna
- more than 60 pages on insect orders
- includes eleven colour plates
- more than 220 figures illustrating the text
- further reading suggestions for each chapter
- includes about 350 references
- more than 1,200 terms explained in the glossary
- cross-references and index included for the reader's convenience
- comprehensive list of forest insect pests of PNG
- includes appropriate, low-ecological impact control measures for forest insect pests

From German Development Service, P.O. Box 1862, Boroko N.C.D., PNG, ph. +675 - 325 5380, fax +675 - 325 9377, email DEDPAP@online.net.pg or mfschneider@hotmail.com.

The following two CD-ROMs were sponsored by the German Development Service and copies free of charge will be distributed to libraries of universities, NARI, DAL, Forest Authority, particular NGOs and individuals.

John W. Dobunaba and Michael F. Schneider (1999): Binatang - A Pictorial Catalogue of the Insects of Papua New Guinea; on CD-ROM; contains the images of about 1000 insect species of various orders; ISBN 9980-85-261-5

Michael F. Schneider (1999): Key to the Forest Insect Pests of Papua New Guinea; ISBN 9980-85-260-7; interactive CD-ROM and Internet version (<http://www.travelcam.com.au/mschneider/index.htm>)

Features of this Key:

- the first electronic medium published in Papua New Guinea
- allows the quick identification of common and less common forest insect pests of PNG
- made of almost 100 pages containing about 200 mainly coloured illustrations
- simply select the diseased tree from a list
- the symptoms and the causing insect pests are shown on colour photos
- includes appropriate, low-ecological impact control measures for forest insect pests
- includes further information on forest fire, preventive measures and insect signs & symptoms
- includes important links to web pages of relevant organisations
- includes an illustrated glossary which explains over 500 terms
- includes further reading/references on forest insect pests

From Caroline Raymakers (Fisheries Research Officer), TRAFFIC Europe (WWF-Belgium), Ch. de Waterloo 608, B-1050 Brussels, Belgium, Tel: 32-2-343 82 58, Fax: 32-2-343 25 65, Email: craymakers@traffic-europe.com

Raymakers, Caroline. 1999. Imports of Indonesian Marine Products into the European Union 1990-1995, TRAFFIC Europe and WWF-NL.

From Fauna Malesiana, Rene Dekker, National Museum of Natural History, P.O. Box 9517, 2300 RA Leiden, The Netherlands, phone (31) 71-516-2622, fax (31) 71-513-3344

J. Sugardjito, S. Wiryoatmodjo and Mohammad Amir. 2000. Illustrated Atlas of Traded Animal Species of Indonesia. Research and Development Centre for Biology (LIPI), Bogor, Indonesia.

This illustrated atlas of traded animal species of Indonesia is aimed at developing a comprehensive guide dealing with species traded in significant numbers in Indonesia. It is aimed at people employed in the animal business, such as customs, to improve their knowledge of wildlife identification and regulation.

Other forthcoming guides and CD-ROM's in the Fauna Malesiana Handbook and Fieldguide Project:

Handbooks

Larvae of the Indo-Pacific coastal fishes, J.M. Leis and B. Carson-Ewart

The families of Malesian moths and butterflies, J.D. Holloway, G. Kibby and D. Peggie

Field Guide

Malesiana Guide to the snakes of Sumatra, Java and Bali, L. Smith, and I. Sidik

CD-ROM's

The corals and other reef-dwelling coelenterates of the Indo-Malayan seas, B.W. Hoeksema

Dacine fruit flies (Diptera, Tephritidae, Dacini) of Malesia, I.M. White and D.L. Hancock

Mosquito vectors (Diptera, Culicidae) of Malesia, R.E. Harbach and G.R. Sandlant

From (if outside Indonesia) Pat Gleason, Conservation International, Washington Office, Email:

p.gleason@conservation.org

From (if inside Indonesia) Iwan H Wijayanto, Conservation International – IP, Jakarta Office, Email:

iwan@conservation.or.id

The Irian Jaya Biodiversity Conservation Priority-Setting Workshop - Biak, 7-12 January 1997, Final Report and CD-ROM, Editor in Chief: Jatna Supriatna, Conservation International, 1999, ISBN 1 881173-28-3

The Irian Jaya Biodiversity Conservation Priority-Setting Workshop had three primary objectives:

1. to help delineate the most critical priority areas for biodiversity conservation based on expert scientific information;
2. to assess the local capacity for implementing conservation and sustainable development-oriented activities; and
3. to seek a consensus among government and academic institutions and NGOs about how best to integrate conservation and development planning in Irian Jaya.

Socio-economic factors, including the implications of current and future development plans and demographic trends for local people and biota in Irian Jaya, were also examined. The process itself was divided into three phases. The first phase included the compilation and synthesis of information to produce a comprehensive, integrated information system on the state of knowledge of Irian Jaya's biodiversity. The second phase included a priority-setting workshop that brought together leading scientists, considered experts on the province. These scientists worked together to produce an integrated assessment on the current status of biodiversity, and also to determine a set of priorities concerning future research, policy, and conservation action. The final phase of the process, which is currently underway, involves the dissemination of information to aid in decision making. The results of the workshop, which include a comprehensive information system, the workshop map, and this report, are currently being distributed and used as an important base for decision making concerning the future of Irian Jaya's biodiversity.

This document presents the entire process with special emphasis on the second phase: the expert workshop itself and results of this workshop. Although we do cover the initial phase of data collection and information synthesis, only the results of the second phase are presented. For more details on the information assembled and available from this project, a CD-ROM has been published that contains all data from both the information phase and the workshop phase. The CD-ROM includes all GIS maps, biological collections, detailed expert forms, group reports and workshop documents, as well as images of the biodiversity of Irian Jaya that were used during the workshop.

From <http://www.orientalbirdclub.org/club/join.html>

The Oriental Bird Club, UK registered charity 297242, now has more than 1900 members in over 50 countries. Membership is open to all. Each year members receive: The Oriental Bird Club journal, Forktail, containing papers on the distribution, conservation, ecology and biology of the region's birds; Two Oriental Bird Club Bulletins containing news, recent reports, reviews and feature articles.

Others without ordering addresses:

Property Rights and Economic Development: Land and Natural Resources in Southeast Asia and Oceania. Edited by Toon van Meijl and Franz von Benda-Beckmann, London/New York: Kegan Paul International, 1999, 295 pp. ISBN 0-7103-0641-5 (HB)

Global review of wetland resources and priorities for wetland inventory, 2nd edition. Edited by CM Finlayson and AG Spiers. URL: http://www.wetlands.agro.nl/programs/GRoWi_2nd_edn/welcome.html

Pasternak, Jan. 2000. Fluttering Encounters in the Amazing Archipelago. Format B4 225x295, hardcover, 203 colour photos, 136 pp. Thirty years of photography and field studies on butterflies by the author beginning in 1970 in Papua New Guinea up to the present days in Indonesia are compiled and presented in this book.

Karsenty, Alain. Economic instruments for tropical forests - The Congo Basin Case.

Economic instruments - taxes, royalties, quotas, auctions, permit markets, subsidies, performance bonds, timber certification, log export bans, carbon dioxide markets - lie at the heart of contemporary debate over 'sustainable management' of tropical forests and especially one of its most controversial aspects: logging. Drawing on economic theory and concrete examples mainly from Central Africa but also from south-east Asia, this book provides a pragmatic and stimulating view of the forestry policy issues bound up with these new aspects of tropical forest management at the crossroads of economics and ecology. This book is in the series: Instruments for sustainable private sector forestry series: IED - CIRAD - CIFOR, IED: ISSN 1560-9308, CIRAD: ISBN 2 87614 376 3

Laird, Sarah A, editor. 2000. Biodiversity and Traditional Knowledge: Equitable Partnerships in Practice.

Published in association with WWF International and UNESCO, this manual demonstrates how to arrive at equitable and successful arrangements over access to, and the commercial development of, genetic resources. It draws on experience from a range of countries around the world to show how the benefits from the commercial use of biodiversity can be maximised and shared equitably while also achieving local conservation and development objectives.

Russell Mittermeier, Norman Myers and Cristina Goettsch Mittermeier. 2000. Hotspots: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions.

Hotspots covered are: Tropical Andes; Mediterranean Basin; Madagascar/Indian Ocean Islands; Mesoamerica; Caribbean Islands; Indo-Burma; Atlantic Forest of Brazil; Philippines; Cape Floristic Region of South Africa; Mountains of South Central China; Sundaland; Brazilian Cerrado; Southwest Australia; Polynesia and Micronesia;

New Caledonia; Choco/Darien/Western Ecuador; Western Ghats & Sri Lanka; California Floristic Province; Succulent Karoo; New Zealand; Central Chile; Guinean Forests of West Africa; Caucasus; Eastern Arc Mountains, Coastal Forests of Kenya and Tanzania; and Wallacea.

- David Gibbs, Eustace Barnes and John Cox. 2000. Pigeons and Doves: A Guide to the Pigeons and Doves of the World. This is the first book to be dedicated to the identification of pigeons and doves in the field and incorporates all recent information on the 313 species, as well as detailing, with great precision, their identifying characteristics.
- H. Ota. 1999. Tropical Island Herpetofauna: Origin, Current Diversity, and Conservation Proceedings of the International Symposium, "Diversity of Reptiles, Amphibians, and Other Terrestrial Animals on Tropical Islands: Origin, Current Status, and Conservation", Okinawa, Japan, 6-7 Jun 1998
- Jen Veron and Mary Stafford Smith. 2000. Corals of the World: Reef Building Corals Worldwide. A magnificent reference, providing a comprehensive and authoritative coverage of reef-building corals at species, genera and family levels. Non-technical summaries of the distinguishing characters of all taxa are given with information about the colours, habitats and abundances of all species. One thousand distribution maps, generated from verified published records, research and underwater sightings are included, along with over three thousand underwater photographs covering all the major coral reef regions of the world portraying the variety and the beauty of corals as never before.

Scientific Literature



If you haven't sent your publication list in yet (your papers about New Guinea), please send these citations to Deb so we can include them in a future issue. It doesn't matter if you have one paper, or 30 papers-- the rest of us want to know about it! We would really like to know what you have found out about New Guinea; that is the purpose for this newsletter—to share information. If you have more than one page of citations, please send your list on disk or by email (preferably in Word) if possible-- thanks! In addition, don't forget that we offer a reference-finding service for those of us without inter-library loan. If you need a particular reference and cannot find it or do not have access to it, please write and we will see if we can find it for you and send it to you. (Not just the citations in the newsletter, you can request any citation).

Alistair Hay - Plants

Hay, A. 1999. Revision of Homalomena (Araceae-Homalomeneae) in New Guinea, the Bismarck Archipelago and Solomon Islands. *Blumea* 44 (1999) 41-71.

Howard Rogers – Plants

Rogers, H.M. and Hartemink, A.E. 2000. Soil seed bank and growth rates of an invasive species, *Piper aduncum*, in the lowlands of Papua New Guinea. *Journal of Tropical Ecology* 16: 243-251.

Yves Basset - Insects

- Basset, Y. (1995) Arthropod predator-prey ratios on vegetation at Wau, Papua New Guinea. *Science in New Guinea* 21, 103-112.
- Basset, Y. (1996) Local communities of arboreal herbivores in Papua New Guinea: predictors of insect variables. *Ecology* 77, 1906-1919.
- Basset, Y. (1997) Species - abundance and body size relationships in insect herbivores associated with New Guinea forest trees, with particular reference to insect host-specificity. In *Canopy Arthropods* (eds N.E. Stork, J.A. Adis & R.K. Didham). Chapman & Hall, London, Pp. 237-264.
- Basset, Y. & Novotny, V. (1999) Species richness of insect herbivore communities on *Ficus* in Papua New Guinea. *Biological Journal of the Linnean Society* 67, 477-499.
- Basset, Y., Novotny, V. & Weiblen, G. (1997) *Ficus*: a resource for arthropods in the tropics, with particular reference to New Guinea. In *Forests and Insects* (eds A. D. Watt, N.E. Stork & M. D. Hunter). Chapman & Hall, London, pp. 341-361.
- Basset, Y. & Samuelson, G.A. (1996) Ecological characteristics of an arboreal community of Chrysomelidae in Papua New Guinea. In *Chrysomelidae Biology. Volume 2: Ecological Studies* (eds P. Jolivet, M. L. Cox & T.H. Hsiao). SPB Academic Publishing, Amsterdam, Pp. 243-262.
- Basset, Y., Samuelson, G.A., Allison, A. & Miller, S.E. (1996) How many species of host-specific insects feed on a species of tropical tree? *Biological Journal of the Linnean Society* 59, 201-216.
- Basset, Y., Samuelson, G.A. & Miller, S.E. (1996) Similarities and contrasts in the local insect faunas associated with ten forest tree species of New Guinea. *Pacific Science* 50, 157-183.
- Novotny, V. & Basset, Y. (1998) Seasonality of sap-sucking insects (Auchenorrhyncha, Hemiptera) feeding on *Ficus* (Moraceae) in a lowland rain forest in New Guinea. *Oecologia* 115, 514-522.
- Novotny, V. & Basset, Y. (1999) Body size and host plant specialisation: a relationship from a community of herbivorous insects from new Guinea. *Journal of Tropical Ecology* 15, 315-328.
- Novotny, V., Basset, Y., Auga, J., Boen, W., Dal, C., Drozd, P., Kasbal, M., Isua, B., Kutil, R., Manumbor, M. & Molem, K. (1999) Predation risk for herbivorous insects on tropical vegetation: a search for enemy-free space and time. *Australian Journal of Ecology* 24, 477-483.

- Novotny, V., Basset, Y., Miller, S.E., Allison, A., Samuelson, G.A. & Orsak, L. (1997) The diversity of tropical insect herbivores: an approach to collaborative international research in Papua New Guinea. In *Proceeding of the International Conference on Taxonomy and Biodiversity Conservation in the East Asia* (eds B.H. Lee, J.C. Choe & H.Y. Han). Korean Institute for Biodiversity research of Chonbuk National University, Chonju, Pp. 112-125.
- Novotny, V., Basset, Y., Samuelson, G. A. & Miller, S. E. (1999) Host use by chrysomelid beetles feeding on Moraceae and Euphorbiaceae. In *Advances in Chrysomelidae Biology 1* (ed. M. L. Cox). Backhuys Publ., Leiden, pp. 343-360.
- Springate, N.D. & Basset, Y. (1996) Diel activity of arboreal arthropods associated with Papua New Guinean trees. *Journal of Natural History* 30, 101-112.

Allen Allison - New Guinea Bibliography

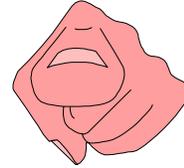
- Allison, Allen. 1982. Distribution and ecology of New Guinea lizards. In J. Linsley Gressitt (ed.) *Monographiae Biologicae*. Vol. 42, pp. 803-813. Dr W. Junk Publishers, The Hague.
- Allison, Allen. 1993. Biodiversity and conservation of the fishes, amphibians, and reptiles of Papua New Guinea. In Bruce M. Beehler (ed.) *Papua New Guinea conservation needs assessment*. Vol. 2, pp. 157-225. The Biodiversity Support Program, Washington, D.C.
- Allison, Allen. 1996. Zoogeography of amphibians and reptiles of New Guinea and the Pacific region. In Allen Keast and Scott E. Miller (eds.), *The origin and evolution of Pacific Island biotas, New Guinea to eastern Poynesia*. pp. 407-436. SPB Academic Publishing, Amsterdam.
- Allison, Allen, David Bickford, Stephen Richards, and Geordie Torr. 1998. Herpetofauna. In Andrew L. Mack (ed.) *A biological assessment of the Lakekamu Basin, Papua New Guinea*. RAP Working Papers 9, pp. 58-62; 156-172. Conservation International, Washington, D.C.
- Allison, Allen, and Allen E. Greer. 1986. Egg shells with pustulate surface structures: basis for a new genus of New Guinea skinks (Lacertilia: Scincidae). *Journal of Herpetology* 20(1):116-119.
- Allison, Allen, and Fred Kraus. In Press. A new species of frog of the genus *Xenorhina* (Anura: Microhylidae) from the North Coast Ranges of Papua New Guinea. *Herpetologica*
- Allison, Allen, and Fred Kraus. Submitted. A new species of *Platymantis* (Anura: Ranidae) from New Ireland, Papua New Guinea. *Copeia*
- Arita, Y., and Scott. E. Miller. (Paper in manuscript or in preparation). Taxonomic notes on New Guinea Choreutidae (Lepidoptera).
- Basset, Yves. 1995. Arthropod predator-prey ratios on vegetation at Wau, Papua New Guinea. *Science in New Guinea* 21:103-112.
- Basset, Yves. 1995. Host specificity of rainforest arthropods, with special reference to the canopy. In R. Lücking, M. Freiberg, A. Lücking, E. Freiberg and G. Gottsberger (eds.). *Second International European Science Foundation Workshop on Tropical Canopy Research, Gönzburg, Germany*. 44-47 pp.
- Basset, Yves. 1996. Leaf chewing insects feeding on figs (*Ficus* spp.) in the Madang area: species richness and host specificity [abstract]. *Science in New Guinea* 21:140-141.
- Basset, Yves. 1996. Local communities of arboreal herbivores in Papua New Guinea: predictors of insect variables. *Ecology* 77:1906-1919.
- Basset, Yves, H.-P. Aberlenc, Neal. D. Springate, and G. Delvare. 1997. A review of methods for sampling arthropods in tree canopies. In N. E. Stork, J. A. Adis and R. K. Didham (eds.), *Canopy Arthropods*. Chapman & Hall, London.
- Basset, Yves, Vojtech Novotny, Scott E. Miller, and Richard Pyle. In Press. *Parataxonomists and digital photography in ecological and entomological research: experience from Papua New Guinea and Guyana*. BioScience
- Basset, Yves, Vojtech Novotny, Scott E. Miller, and Neal D. Springate. 1998. Assessing the impact of forest disturbance on tropical invertebrates: some comments. *Journal of Applied Ecology* 35:461-466.
- Basset, Yves, Vojtech Novotny, and George Weiblen. In press. *Ficus: a resource for arthropods in the tropics, with particular reference to New Guinea*. In A. Watt, N. E. Stork and M. Hunter (eds.), *Forests and Insects: 18th Symposium of the Royal Entomological Society*. Academic Press, London.
- Basset, Yves, and Larry Orsak. 1996. The all-taxa biological inventory in Costa Rica: an example for Papua New Guinea? *Science in New Guinea* 21:141.
- Basset, Yves, and G. Allan Samuelson. 1996. Ecological characteristics of an arboreal community of Chrysomelidae in Papua New Guinea. In P. Jolivet, M. L. Cox and T. H. Hsiao (eds.), *Chrysomelidae Biology. Volume 2: Ecological Studies*. Vol. 2, pp. 243-262. SPB Academic Publishing, Amsterdam.
- Basset, Yves, G. Allan Samuelson, Allen Allison, and Scott E. Miller. 1996. How many species of host-specific insects feed on a species of tropical tree? *Biological Journal of the Linnean Society* 59:201-216.
- Beehler, Bruce M. 1985. Conservation of New Guinea rain forest birds. In A.W. Diamond and T.E. Lovejoy (eds.), *Conservation of tropical forest birds*. pp. 233-246. ICBP Technical Publication No. 4, Cambridge.
- Beehler, Bruce M. 1993. Mapping PNG's biodiversity. In Bruce M. Beehler (ed.) *Papua New Guinea conservation needs assessment*. Vol. 2, pp. 193-209. The Biodiversity Support Program, Washington, D.C.
- Bleeker, Pieter. 1983. *Soils of Papua New Guinea*. Commonwealth Scientific and Industrial Research Organization, Australia, in association with Australian National University Press, Canberra, Australia.
- Blum, J.P., and James I. Menzies. 1988. Notes on *Xenobatrachus* and *Xenorhina* (Amphibia: Microhylidae) from New Guinea with description of nine new species. *Alytes* 7(4):125-163.
- Böhme, Wolfgang, Hans-Georg Horn, and Thomas Ziegler. 1994. Zur Taxonomie der Pazifikwarane (*Varanus-indicus* Komplex): Revalidierung von *Varanus doreanus* (A.B. Meyer, 1874) mit Beschreibung einer neuer Unterart. *Salamandra* 30(2):119-142.
- Boston, Anthony N. 1996. *BioRap: Rapid assessment of biodiversity*. Vol. 1: The BioRap biological database. Australian BioRap Consortium: The Australian National University Centre for Resource and Environmental Studies, CSIRO Division of Wildlife and Energy and the Department of Environment, Sport and Territory Environmental Resources

- Information Network, Canberra. 40 p.
- Brown, Walter C. 1991. Lizards of the genus *Emoia* (Scincidae) with observations on their ecology and biogeography. *Memoirs of the California Academy of Sciences* 15:i-vi, 1-94.
- Brown, Walter C., and Allen Allison. 1986. A New lizard of the genus *Emoia* (Scincidae) from Morobe Province, Papua New Guinea. *Bishop Museum Occasional Papers* 26:47-51.
- Brown, Walter C., and Fred Parker. 1973. A new species of *Cyrtodactylus* (Gekkonidae) from New Guinea with a key to species from the island. *Breviora* 417:1-7.
- Brown, Walter C., and Fred Parker. 1977. Lizards of the genus *Lepidodactylus* (Gekkonidae) from the Indo-Australian archipelago and the islands of the Pacific, with descriptions of new species. *Proceedings of the California Academy of Sciences, series 4*, 41(8):253-265.
- Burton, Thomas Charles. 1986. A reassessment of the Papuan subfamily Asterophryinae (Anura: Microhylidae). *Records of the South Australian Museum* 19(19):405-450.
- Chappell, John. 1974. Geology of coral terraces, Huon Peninsula: a study of Quaternary tectonic movements and sea-level changes. *Bulletin of the Geological Society of America* 85:553-570.
- Chappell, John. 1976. Aspects of late Quaternary palaeogeography of the Australian-east Indonesian Region. In R.L. Kirk and A.G. Thorne (eds.), *The Origin of the Australians*. pp. 11-22. Hedges & Bell, New Jersey.
- Cogger, Harold G. 1975. *Reptiles and amphibians of Australia*. First ed. A.H. & A.W. Reed Pty. Ltd., Sydney. 584 [NEED TO CONFIRM] p.
- Cogger, Harold G. 1992. *Reptiles and amphibians of Australia*. Fifth ed. Cornell University Press, Ithaca. 765 p.
- Collins, N. Mark, Jeffrey A. Sayer, and Timothy C. Whitmore. 1991. *The Conservation atlas of tropical forests: Asia and the Pacific*. Simon & Schuster, New York. 256 p.
- Collins, Timothy, Fred Kraus, and George Estabrook. 1994. Compositional effects and weighting of nucleotide sequences for phylogenetic analysis. *Systematic Biology* 43:449-459.
- Dal, Chris, and Yves Basset. 1996. Leaf chewing insects feeding on figs (*Ficus* spp.) in the Madang area: methods and faunal composition [abstract]. *Science in New Guinea* 21:141.
- Davies, Hugh L., R.D. Winn, and P. KenGemar. 1996. Evolution of the Papuan Basin - a view from the orogen. In P.G. Buchanan (ed.) *Petroleum exploration, development and production in Papua New Guinea*. *Proceedings of the Third Papua New Guinea Petroleum Convention*. pp. 53-62. PNG Chamber of Mines and Petroleum, Port Moresby, Papua New Guinea.
- Diamond, Jared M. 1973. Distributional ecology of New Guinea birds. *Science*, 23 February 1973. pp. 759-769.
- Dow, David B. 1977. *A geological synthesis of Papua New Guinea*. Bureau of Mineral Resources, Geology and Geophysics Bulletin, Australian Government Publishing Service, Canberra 201:vii + 41.
- Erwin, Terry L. 1982. Tropical forests: their richness in Coleoptera and other arthropod species. *Coleopterists Bulletin* 36:74-75.
- Faith, Daniel P., and A.O. Nicholls (eds.). 1996. *BioRap: Rapid assessment of biodiversity*. Vol. 3 Tools for assessing biodiversity priority areas. Australian BioRap Consortium: The Australian National University Centre for Resource and Environmental Studies, CSIRO Division of Wildlife and Energy and the Department of Environment, Sport and Territory Environmental Resources Information Network, Canberra. 121 p.
- Greer, Allen E. 1970. A subfamilial classification of scincid lizards. *Bulletin of the Museum of Comparative Zoology* 139:151-183.
- Greer, Allen E., and Fred Parker. 1974. The fasciatus species group of *Sphenomorphus* (Lacertilia: Scincidae): notes on eight previously described species and descriptions of three new species. *Papua New Guinea Scientific Society Proceedings* 25:31-61.
- Gressitt, J. Linsley, J. J. H. Szent-Ivany, and Scott E. Miller. (In preparation). *Bibliography of New Guinea entomology*. (Revised and updated from 1968 book). Publication for world wide web, includes over 7000 annotated citations
- Hamilton, Warren. 1979. *Tectonics of the Indonesian region*. U.S. Geological Survey Professional Paper 1078:1-345.
- Hutchinson, Michael F., L. Belbin, A.O. Nicholls, Henry A. Nix, J.P. McMahon, and K.D. Ord. 1996. *BioRap: Rapid assessment of biodiversity*. Vol. 2: spatial modelling tools. Australian BioRap Consortium: The Australian National University Centre for Resource and Environmental Studies, CSIRO Division of Wildlife and Energy and the Department of Environment, Sport and Territory Environmental Resources Information Network, Canberra. 142 p.
- Jaques, A.L., and G.P. Robinson. 1977. The continent/island-arc collision in northern Papua New Guinea. *BMR Journal of Australian Geology and Geophysics* 2:289-303.
- Johns, Robert J. 1993. Biodiversity and conservation of the native flora of Papua New Guinea. In Bruce M. Beehler (ed.) *Papua New Guinea conservation needs assessment*. Vol. 2, pp. 15-75. The Biodiversity Support Program, Washington, D.C.
- Kareiva, P. 1993. No shortcuts in mew maps. *Nature* 365:202-203.
- Kraus, Fred. 1988. An empirical evaluation of the use of the ontogeny polarization criterion in phylogenetic inference. *Systematic Zoology* 37:106-141.
- Kraus, Fred. 1995. A revision of the Caribbean genus *Pseudopineria* (Gastropoda: Urocoptidae). *Malacological Review* 28:107-117.
- Kraus, Fred, and Allen Allison. In Press. Two new species of *Cophixalus* (Anura: Microhylidae) from New Guinea. *Journal of Herpetology*
- Kraus, Fred, and Allen Allison. Submitted. A review of the endemic New Guinea microhylid genus *Choerophryne*. *Journal of Herpetology*
- Kraus, Fred, and Wesley M. Brown. 1998. Phylogenetic relationships of colubroid snakes based on mitochondrial DNA sequences. *Zoological Journal of the Linnean Society* 12:455-487.
- Kraus, Fred, Daniel G. Mink, and Wesley M. Brown. 1996. Crotaline intergeneric relationships based on mitochondrial DNA sequence data. *Copeia* :763-773.

- Kroenke, Loren W. 1984. Cenozoic tectonic development of the Southwest Pacific. United Nations Economic and Social Commission, Committee for Co-Ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas (CCOP/SOPAC), Technical Bulletin 6:1-122.
- Kroenke, Loren W. 1996. Plate tectonic development of the western and southwestern Pacific Mesozoic to the present. In Allen Keast and Scott E. Miller (eds.), *The origin and evolution of Pacific Island biotas, New Guinea to eastern Polynesia: patterns and processes.* pp. 19-34. SPB Academic Publishing, Amsterdam.
- Malnate, Edmond V., and Garth Underwood. 1988. Australasian natricine snakes of the genus *Tropidonophis*. *Proceedings of the Academy of Natural Sciences of Philadelphia* 140(1):59-201.
- Margules, Christopher R., and Trevor D. Redhead. 1995. *Biorap: guidelines for using the BioRap methodology and tools.* CSIRO, Canberra. 70 p.
- McAlpine, John Roger, Gael Keig, and R. Falls. 1983. *Climate of Papua New Guinea.* Commonwealth Scientific and Industrial Research Organization in association with Australian National University Press, Canberra, Australia Miami, Fla., USA. 200 p.
- McDowell, Samuel B. 1967. *Aspidomorphus*, a genus of New Guinea snake of the family Elapidae, with notes on related genera (excerpt). *Journal of Zoology, London* 151:497-543.
- McDowell, Samuel B. 1969. *Toxicocalamus*, a New Guinea genus of snakes of the family Elapidae. *Journal of Zoology, London* 159:443-511.
- McDowell, Samuel B. 1970. On the status and relationships of the Solomon Islands elapid snakes. *Journal of Zoology, London* 161:145-190.
- McDowell, Samuel B. 1972. The species of *Stegonotus* (Serpentes, Colubridae) in Papua New Guinea. *Zoologische Mededelingen (Leiden)* 47:6-26.
- McDowell, Samuel B. 1974. A catalogue of the snakes of New Guinea and the Solomons, with special reference to those in the Bernice P. Bishop Museum. Part I. Scolecophidia. *Journal of Herpetology* 8(1):1-57.
- McDowell, Samuel B. 1975. A catalogue of the snakes of New Guinea and the Solomons, with special reference to those in the Bernice P. Bishop Museum. Part II. Aniliodea and Pythoninae. *Journal of Herpetology* 9(1):1-79.
- McDowell, Samuel B. 1979. A catalogue of the snakes of New Guinea and the Solomons, with special reference to those in the Bernice P. Bishop Museum. Part III. Boinae and Acrochordoidea. *Journal of Herpetology* 13(1):1-92.
- McDowell, Samuel B. 1984. Results of the Archbold Expeditions. No. 112. The snakes of the Huon Peninsula, Papua New Guinea. *American Museum Novitates* 2775:1-28.
- Menzies, James I. 1976. Handbook of common New Guinea frogs. Wau Ecology Institute, Handbook 1, Wau, Papua New Guinea. 74 p.
- Menzies, James I. 1987. A taxonomic revision of the Papuan *Rana* (Amphibia: Ranidae). *Aust. J. Zool.* 35:373-418.
- Menzies, James I. 1993. Systematics of *Litoria iris* (Anura: Hylidae) and its allies in New Guinea and a note on sexual dimorphism in the group. *Australian Journal of Zoology* 41:225-255.
- Menzies, James I. 1999. A study of *Albericus* (Anura: Microhylidae) of New Guinea. *Australian Journal of Zoology* 47(4):327-360.
- Menzies, James I., and George R. Zug. 1979. Papuan tree frogs of the *Litoria thesaurensis* group (Salientia: Hylidae). *Micronesica* 15(1):325-333.
- Menzies, James I., and Richard G. Zweifel. 1974. Systematics of *Litoria arfakiana* of New Guinea and sibling species (Salientia, Hylidae). *American Museum Novitates* 2558:1-16.
- Michaux, Brien. 1994. Land movements and animal distributions in east Wallacea (eastern Indonesia, Papua New Guinea and Melanesia). *Palaeogeography, Palaeoclimatology, Palaeoecology* 112(3-4):323-343.
- Miller, Scott E. (Paper in manuscript or in preparation). Reevaluation of Lepidoptera reared from Philippines *Ficus* by F. X. Williams. [Reanalysis of insect and host records from a major rearing program in 1921, useful for comparison to PNG].
- Miller, Scott E., Yves Basset, and Vojtech Novotny. 1996. Worldwide bibliography of arthropods feeding on *Ficus* spp. Published on the world wide web and available at <http://www.bishop-hawaii.org/bishop/ng>
- Miller, Scott E., Robert Cowie, Dan Polhemus, and Lucius Eldredge. 1993. Biodiversity and conservation of the nonmarine invertebrate fauna of Papua New Guinea. In Bruce M. Beehler (ed.) *Papua New Guinea conservation needs assessment.* Vol. 2, pp. 227-325. The Biodiversity Support Program, Washington, D.C.
- Mittermeier, Russell A., Norman A. Myers, and Jorgen B. Thomsen. 1998. Global biodiversity hotspots and major tropical wilderness areas. *Conservation Biology* 12(3):516-519.
- Moody, Scott Michael. 1980. Phylogenetic and historical biogeographical relationships of the genera in the family Agamidae (Reptilia: Lacertilia). Unpublished Ph.D. thesis, University of Michigan, 373 p.
- Naylor, Gavin J., and Fred Kraus. 1995. The relationship between s and m and the retention index. *Systematic Biology* 44:559-562.
- Nix, Henry A., Daniel P. Faith, Michael F. Hutchinson, J.L. Kesteven, Christopher Margules, R., G. Natera, R. Smyth, J.L. Stein, W. Slater, P. Walker, and J. West. 1999. Papua New Guinea Biodiversity Rapid Appraisal Project. Final Report 13 August 1999. Center for Resource and Environmental Studies, Australian National University, CSIRO Division of Wildlife and Ecology, Centre for Plant BIODIVERSITY Research, Australian National Herbarium, Bishop Museum, Department of Environment and Conservation, Papua New Guinea, Canberra, Australia. 110 p.
- Nix, Henry A., and M.A. Switzer. 1991. *Rainforest animals: atlas of vertebrates endemic to Australia's wet tropics.* Australian National Parks and Wildlife Service, Canberra. 112 p.
- Noble, S.J. 1996. BioRap: Rapid assessment of biodiversity. Vol. 4: Tools for storing and mapping spatial data. Australian BioRap Consortium: The Australian National University Centre for Resource and Environmental Studies, CSIRO Division of Wildlife and Energy and the Department of Environment, Sport and Territory Environmental Resources Information Network, Canberra. 37 p.

- Novotny, Vojtech. 1996. Sap-sucking insects (Hemiptera) associated with *Ficus* trees in the Madang Province [abstract]. *Science in New Guinea* 21:146.
- Novotny, Vojtech. 1996. Sap-sucking insects (Hemiptera) associated with *Ficus* trees in the Madang Province [abstract]. *Science in New Guinea* 21:146.
- Novotny, Vojtech. 1997. Community analysis. In M. R. Wilson and M. A. Jervis (eds.), *Leafhopper and Planthopper Technology: Techniques for Research on the Homoptera, Auchenorrhyncha*. Intercept, Andover.
- Novotny, Vojtech, and Yves Basset. 1998. Seasonality of sap-sucking insects (Auchenorrhyncha, Hemiptera) feeding on *Ficus* (Moraceae) in lowland rain forest in New Guinea. *Oecologia* 115:514-522.
- Novotny, Vojtech, and Yves Basset. 1999. Body size and host plant specialization: a relationship from a community of herbivorous insects from New Guinea. *Journal of Tropical Biology* 15:315-328.
- Novotny, Vojtech, and Yves Basset. In Press. Species richness of insect herbivore communities on *Ficus* in Papua New Guinea. *Biological Journal of the Linnean Society*
- Novotny, Vojtech, and Yves Basset. Submitted to *Oikos*. Ecological characteristics of rare species in communities of tropical insect herbivores: pondering the mystery of singletons.
- Novotny, Vojtech, Yves Basset, J. Auga, W. Boen, C. Dal, P. Drozd, M. Kasbal, M. Isua, R. Kutil, M. Manumbor, and K. Molem. In Press. Predation risk for herbivorous insects on tropical vegetation: a search for enemy-free space and time. *Australian Journal of Ecology*
- Novotny, Vojtech, Yves Basset, Scott Miller, Allen Allison, G.A. Samuelson, and Larry Orsak. 1997. The diversity of tropical insect herbivores: an approach to collaborative international research in Papua New Guinea. In B.H Lee, J.C. Choe and H.Y. Han (eds.), *Taxonomy and biodiversity in East Asia*. Proceedings of International Conference on Taxonomy and Biodiversity in East Asia. KIBIO Series 2, pp. 112-125. Korean Biodiversity Council and Korean Institute for Biodiversity Research, Chonju, Korea.
- Novotny, Vojtech, Yves Basset, G. Allan. Samuelson, and Scott E. Miller. 1999. Host use by chrysomelid beetles feeding on Moraceae and Euphorbiaceae. In M. Cox (ed.) *Advances in Chrysomelidae biology* 1. pp. 343-360. Backhuys, Leiden.
- Novotny, Vojtech, and J. Leps. 1997. Distribution of leafhoppers (Auchenorrhyncha, Hemiptera) on their host plant *Oxyspora paniculata* (Melastomataceae) in the understory of a diverse rainforest feeding on *Ficus* (Moraceae) in lowland rain forest in New Guinea. *Ecotropica* 3:83-90.
- Olson, David M., and Eric Dinnerstein. 1998. The Global 200: a representation approach to conserving the earth's most biologically valuable ecoregions. *Conservation Biology* 12(3):502-515.
- Orsak, Larry. 1996. Community development activities at the Christensen Research Institute: prospects, progress and needs. *Misc. Publ.* :14.
- O'shea, Mark. 1996. *A guide to the snakes of Papua New Guinea*. Independent Publishing, Port Moresby, Papua New Guinea. 239 p.
- Pajjmans, K. 1975. *Vegetation of Papua New Guinea*. Division of Land Use Research, Commonwealth Scientific and Industrial Research Organization, Canberra [A.C.T.].
- Pajjmans, K. 1976. *New Guinea vegetation*. Australian National University Press, Canberra. 212 p.
- Papua New Guinea Forest Authority. 1996. *National Forest Plan for Papua New Guinea*. Papua New Guinea Forest Authority, Port Moresby.
- Parker, E.S., and W.K. Gealey. 1983. Plate tectonic evolution of the western Pacific-Indian Ocean region. *Proc. EAPI ASCOPE/CCOP/IOC Workshop on the Geology and Hydrocarbon Potential of the South China Sea and Possibilities of Joint Development*
- Pigram, C.J., and Hugh L. Davies. 1987. Terranes and the accretion history of New Guinea orogen. *BMR Journal of Australian Geology and Geophysics* 10:193-211.
- Pigram, C.J., and P.A. Symonds. 1991. A review of the timing of the major tectonic events in the New Guinea Orogen. *Southeast Asian Earth Sciences* 6(3/4):307-318.
- Polhemus, Dan A. 1996. Island arcs, and their influence on Indo-Pacific biogeography. In Allen Keast and Scott E. Miller (eds.), *The origin and evolution of Pacific Island biotas, New Guinea to eastern Poynesia*. pp. 51-66. SPB Academic Publishing, Amsterdam.
- Prendergast, J.R., R.M. Quinn, J.H. Lawton, B.C. Eversham, and D.W. Gibbons. 1993. Rare species, the coincidence of diversity hotspots and conservation strategies. *Nature* 365:335-337.
- Struckmeyer, Heike I.M., Monica Yeung, and Christopher J. Pigram. 1993. Mesozoic to Cainozoic plate tectonic and palaeogeographic evolution of the New Guinea region. In George J. Carman and Zina Carman (eds.), *Petroleum exploration and development in Papua New Guinea*. pp. 261-290. PNG Chamber of Mines and Petroleum, Port Moresby, Papua New Guinea.
- Tyler, Michael J. 1968. Papuan hylid frogs of the genus *Hyla*. *Zoologische Verhandelingen* 96:3-203.
- Tyler, Michael J. 1972. An analysis of lower vertebrates faunal relationships of Australia and New Guinea. In D. Walker (ed.) *Bridge and barrier: the natural and cultural history of Torres Strait*. Aust. Nat. Univ. Res. School Pacific Stud., Dept. Biogeogr. Geomorph. Publ. BG/3, Canberra.
- Tyler, Michael J. 1979. Herpetological relationships of South America with Australia. In William E. Duellman (ed.) *The South American herpetofauna: its origin and dispersal*. pp. 73-106. Museum of Natural History, University of Kansas, Monograph No. 7, Lawrence, Kansas.
- Tyler, Michael J. 1979. Redefinition and evolutionary origin of the Australopapuan hylid frog genus *Nyctimystes* Stejneger. *Australian Journal of Zoology* 27(5):755-772.
- Tyler, Michael J., and Margaret Davies. 1978. Species-groups within the Australopapuan frog genus *Litoria* Tschudi. *Australian Journal of Zoology, Supplementary Series*, 63:1-47.

- Whitmore, Timothy C., and J.A. Sayer (eds.). 1992. Tropical deforestation and species extinction. Chapman and Hall, London. 153 p.
- Yadi, Abby. 1998. World Bank project to set new stage. PNG Business 299:1.
- Zweifel, Richard G. 1969. Frogs of the genus *Platymantis* (Ranidae) in New Guinea, with the description of a new species. American Museum Novitates 2374:1-19.
- Zweifel, Richard G. 1972. Results of the Archbold Expeditions. No. 97. A revision of the frogs of the subfamily Asterophryinae Family Microhylidae. Bulletin of the American Museum of Natural History 148:415-546.
- Zweifel, Richard G. 1972. A review of the frog genus *Lechriodus* (Leptodactylidae) of New Guinea and Australia. American Museum Novitates 2507:1-41.
- Zweifel, Richard G. 1979. Variation in the scincid lizard *Lipinia noctua* and notes on other *Lipinia* from the New Guinea region. American Museum Novitates 2676:1-21.
- Zweifel, Richard G. 1980. Results of the Archbold Expeditions. No. 103. Frogs and lizards from the Huon Peninsula, Papua New Guinea. Bulletin of the American Museum of Natural History 165:387-434, figures 1-14, 1 table.
- Zweifel, Richard G., and Allen Allison. 1982. A new montane microhylid frog from Papua New Guinea, and comments on the status of the genus *Aphantophryne*. American Museum Novitates 2723:1-14.



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Sampai jumpa lagi!