

# The New Guinea Tropical Ecology and Biodiversity Digest

October 1997



Issue 4

(please send all contributions and corrections to: Deb Wright, P.O. Box 15, Weikert PA, 17885-0015, USA; fax: (1) 717-922-1152; email: "[ddwright@ptd.net](mailto:ddwright@ptd.net)"-- thanks!)



**WCS**  
WILDLIFE CONSERVATION SOCIETY



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This issue we want to thank the Wildlife Conservation Society and Conservation International for providing xeroxing and mailing support -- this is much appreciated!

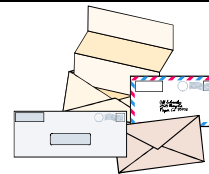
If you want to receive this newsletter on e-mail instead of in the mail (you could print out a hard copy and it would save us xeroxing and postage) (it is formatted in Word for Windows 95) please send us a note saying that this is alright and include your current e-mail address. Thanks! Sometime next year we should have the newsletter at a web site so you can look it up on the internet!

If you need back issues of the Digest, please let us know and we will mail them to you.

From now on we are going to try to get a new issue out every six months so the information stays up-to-date. Please don't forget to send in any information you can contribute!

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## Editorials and Letters



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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!

### Are You Out There?

from your friendly compiler

Because no one sent an editorial in this time, I decided to use this space to remind you that this newsletter depends on you. The whole idea is to share and communicate so *please* send in your contributions. We really do want to know what *you* are up to research-wise,

conservation project-wise, publication-wise, and idea-wise. The next issue will come out in March 1998. Please try to get an article in for that issue and share what you know and/or think! We will all appreciate it! Thanks.



# New Guinea Conservation Projects



Updates anyone??

## Conserving Biological Diversity with Income-Generating Activities through Integrated Conservation and Development (ICAD) Projects in Papua New Guinea

By Stewart Serawe, 4<sup>th</sup> year student in Environmental Sciences and Physical Geography at UPNG

**Abstract**— Conservation has different meanings for different people and cultures. In a land like Papua New Guinea (PNG) with over 750 language groups and customary practices, it may be impossible to come up with one definition.

However, traditionally, conservation practices have been a vital part in sustaining the environment. These have been mainly due to the use of simple technology, limited traditional knowledge of the utilization of natural resources, and sparsely distributed populations. But these are now being subjected to modification and possibly extinction as the country continues to progress politically, socially and economically.

Today, environmentalists and governments around the world recognize the fact that human development must go

hand-in-hand with conservation efforts. And one such approach is the establishment of Integrated conservation and Development (ICAD) Project areas where attempts are being made to conserve biodiversity while at the same time boosting the local peoples' incomes. This paper looks at one such area in PNG, namely the Crater Mountain Wildlife Management Area; the achievements and shortfalls.

This paper was given at the Science, Students and Sustainability Conference held from July 14-18, 1997 at the James Cook University, Townsville, Australia. If you would like a copy of the paper, please write to: Stewart Serawe, Environmental Sciences, University of PNG, P.O. Box 112, Boroko NCD, Papua New Guinea.

## 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 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!

### Moth Surveys by PNG School Leavers to Explore Forest Diversity

From Barry Andreas at CRI

Christensen Research Institute (CRI) has been using *mangi binatang* school leaver surveyors since 1995 to carry out biodiversity surveys throughout PNG. The focus is on moths. The purpose of these surveys is to increase our knowledge of the moth fauna of the country, and to identify sites within conservation areas of interest, which might have exceptional biological diversity. The programme is under the direction of Larry Orsak.

Major surveys have now been carried out in these areas:

Hawain Arin area in the East Sepik Province  
Madang Province – Hagahai, Karkar, Baitabag and forests in the Madang area  
Crater Mountain in the Simbu Province  
Kikori Basin – Southern Highlands and Gulf

Provinces

Wide Bay – East New Britain Province east of Pomio, Southern New Ireland in and above the Weitten Valley

We normally set up camps at four different elevations along a transect. The longest and most intensive surveys have been in Kikori Basin, where we surveyed 12 sites in nearly 2 months. This was funded by World Wildlife Fund (USA). In July 1995 we surveyed 8 sites at Wide Bay, East New Britain from sea level to 1450m and collected over 10,000 specimens. Interesting endemic moths began appearing at 600m. The moth results mirrored that of the plant studies carried out by Lawong Balun and Emerick Davige. Highest diversity seems to be at 600 and 800m elevation. The study was funded by a BCN grant given to

Pacific Heritage Foundation (Rabaul). At Crater Mountain we have surveyed 3 sites from 120m to 1400m elevation so far, and we plan to collect at several more elevations there in the future. Wildlife Conservation Society-NYZS (USA) is funding these surveys.

We have learned to do most of the work that has been done by professional scientists. We collect the moths in the field. When we get back to CRI, we sort them into species groups. We use a reference collection that we create for each site, and each representative of a species we give a separate accession number. We then enter all this information on how many specimens are collected of each species at each site into the computer. Other researchers later

go through these data and calculate biodiversity indices from them.

The MacArthur Foundation (USA) now pays for most of our salaries. We also get support from the Christensen Fund (USA) which pays for the overhead costs of our work.

The mangi binatang school leavers who are active in these surveys are happy to provide more information about what we do. For more information contact Barry Andreas, Joe Somp, or Andrew Kinibel at: Christensen Research Institute, P.O. Box 305, Madang, Papua New Guinea.

## Fish Monitoring in Lake Kutubu, PNG

From Lako Laveape, Conservation Officer for WWF

WWF has conducted a series of fish monitoring in Lake Kutubu from January 1996 through February 1997. This has been done because the landowners around the lake have been complaining that the fish populations are declining. The monitoring will help to find management resolution to increase the fish population in the Lake. It will also help to provide baseline information so that any changes that occur in the future can be detected.

This monitoring will give landowners proof of any declines or increases in the fish population. It will also give

information on the size of fish caught, whether they were males or females, which types of fish were caught using what methods, where different fish species were caught, and how much time each day people spend fishing. We answered these questions by examining and weighing the fish caught and by interviewing fishermen and women when they returned to the canoe place. The final report is yet to be compiled. For more information please contact: Lako Laveape, WWF, P.O. Box 11 at Moro Camp, Lake Kutubu, Southern Highlands Province, PNG, fax: (675) 549-6392

## Reproductive Aspects of *Cherax lorentzi* (Crustaceae: Parastacidae) in Klasafet Water Shed, Sorong- Irian Jaya

From Ricardo Ferdinand Tapilatu, Faculty at UNCEN

**Abstract**— Samples were taken from six stations in five rivulets for a total of 774 *Cherax lorentzi* captured from the Klasafet Water Shed. Results show that the *C. lorentzi* varied from 15.05 to 61.15 mm in carapace length and from 1.8 to 121 g in mass. The rivulet with the fastest current was overwhelming male-biased, but the other rivulets had relatively equal sex ratios. When female carapace length was 25mm, eggs began to develop in the ovarium, and five stages of gonadal maturity followed. At a minimum carapace length of 30.9mm the eggs were in stage 5 and were fully developed. Male testes began to develop at 24mm carapace length, went through three stages of gonadal maturity and were ready to fertilize eggs at a minimum carapace length of 28.7mm. Only 7% of the females captured had mature, stage 5 eggs, but this may have been an underestimate for this

group because females tend to hide when their eggs are nearing maturity and would be hard to catch. Of the captured males, 28% had mature testes. Gonad mass made up a larger proportion of total body mass for smaller females than for larger females within the same gonadal stage; this suggests that larger females do not have proportionately larger broods. For the last three maturity stages, this gonadal index ranged from 0.8 to 3.6% and did not differ between the stages. Three females were captured brooding clutches and their fecundity varied from 61 to 71; fecundity tended to increase with carapace length.

For more information about this study please contact Ricardo Tapilatu at: Agriculture Faculty, Cenderwasih University P.O. Box 023, Manokwari, 98314, Irian Jaya, Indonesia.

## Nest-Weaving Ants and a survey in New Britian

From Simon Robson

**Dr. Simon Robson** from the James Cook University in Australia is going to visit the Gasmisi Village (Bedamuni language group) via Nomad in the Western Province of Papua New Guinea. He will be going in January 1998 with Dr. Peter Dwyer and Dr. Monica Minnegal. Dr. Robson has been working on the evolution and organization of nest weaving behaviour in the ant genus *Polyrhachis* in Australia and during this trip he will be able to add representative species that are unavailable in Australia. During February Robson will continue these studies in New Britian (the home of yet another key *Polyrhachis* species). He will be joined by

Steve Richards (herpetology) and David Slaney (cave invertebrates) from James Cook University. Frank Howarth from the Bishop Museum may also join the team to work on cave invertebrates. Together they plan to conduct an intensive survey of the region. Any questions/suggestions/comments are welcome and can be sent to: Simon Robson, James Cook University, Department of Zoology, Townsville 4811, fax: (61) 077-251-570, email: [simon.robson@jcu.edu.au](mailto:simon.robson@jcu.edu.au)

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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.

### Statements of Interests:

**Dr. David Frodin** is a member of the Kew Herbarium staff and he specializes on Araliaceae, especially the Schefflera. He has completed a 12 page document estimating the relative knowledge of Papuan plant families. If this sounds like it could be of use in your research, you can write or email to Dr. Frodin for a copy: Royal Botanic Gardens Herbarium (Kew), Richmond, Surrey, TW9 3AB, United Kingdom; [d.frodin@rbgkew.org.uk](mailto:d.frodin@rbgkew.org.uk)

**Ricardo F. Tapilatu** is a Junior Lecturer and researcher with the Agriculture Faculty at Cenderawasih University in Manokari, Irian Jaya. His field interests

involve aquatic biology and he has completed research with the freshwater crustaceans *Cherax lorentzi* and *Macrobrachium* sp. He is currently writing a paper about Reproduction in *Cherax lorentzi* in Klasafet Water Shed, Sorong, Irian Jaya.

**Ross Sinclair** is a graduate student at the University of Otago in New Zealand. He has worked in New Guinea since 1992. Ross is interested in the conservation and research of megapodes (he has spent several years working with these birds), harvest management, biological surveys and monitoring, and research by management.

### Wanted: Information on *Piper aduncum*

In many parts of Papua New Guinea the secondary fallow vegetation is dominated by *Piper aduncum* which seems to have been imported into the country during or after WWII. Not much is known on this piper and I would

therefore highly appreciate any information which you may have. Please write or fax to: Alfred Hartemink, University of Technology, Department of Agriculture, P.O. Box 82, Lae, Papua New Guinea; fax: (675) 475-7380.

### New Guinea Biological Society Meeting

From James Menzies

The 1997 conference of the New Guinea Biological Society was held on Motupore Island, the field station of the University of Papua New Guinea, between August 25<sup>th</sup> and 27<sup>th</sup>. Registrations totaled just over 100, which is probably a record, and the maximum number that attended any one session was 94, which severely taxed that capacity of the field station to accommodate and feed!

Eleven participants came from Irian Jaya and 40 were students from UPNG. Twenty-six review or research papers were presented which meant a full timetable during two and a half days. It is difficult to pick out any presentations for special mention, but a series of research papers by the staff of Motupore Island started the meeting off well. The team from Cenderawasih University gave evidence

of their continuing survey work in their country, including fishes, butterflies and forest composition while several UPNG students presented their special topics and honours projects in preliminary form.

At the conclusion of the conference, it was announced that the 1998 meeting would be held at Timika, Irian Jaya by courtesy of Freeport Indonesia.

The 1997 conference was largely supported by a grant from the University's research committee, but a late donation from Placer (PNG) Pty Ltd. was most welcome.

Abstracts from the papers presented at the meeting will be in the December 1997 issue of Science in New Guinea (see Scientific Literature in this newsletter for more information about this journal).

Another Internet site to check out:

<http://forests.org/gaianf.html>

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## Research Stations

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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. If you want to send some pictures too, we can scan them into the newsletter. Thanks!

### Motopore Island Research Department (MIRD)

From John Rewald, Acting Head of Department

This research facility is located at Bootless Bay off the East Hiri Coast about 15 km SE of Port Moresby in PNG. MIRD is associated with the University of Papua New Guinea. The island encompasses 19 ha of land including eucalypt savannah, monsoonal woodland and a limited strand formation. The surrounding waters include fringe, patch and barrier reefs, sea-grass and algal beds, mangroves, and intertidal and sublittoral carbonate and mud areas. The coastal reefs remain in good condition with no indications of the use of explosives or coral mining; they are among the best reefs in the world.

The island has two hostels. One building houses 20 people in three dormitories. Another building houses 12 people in bunkbeds in 6 rooms. Refrigerators and freezers are supplied for both buildings and fresh water is available via rainfall. The tourist Loloata Island Resort is located on a nearby island and gives discounts at its bar and restaurant to MIRD researchers. There is a dry lab and a wet lab at MIRD. The wet lab has 5 indoor water tables and 10 circular outside tanks with aeration and circulation. Additional aquaria and pumps are available. A workshop attached to the wet lab has tools and microscopes. Further equipment is available from UPNG upon request. There is 24 hour 240V 50Hz power on

the island. There are 2 compressors on the island to fill air tanks (cylinders and weights are provided for divers). Nine boats with motors are available for research use.

The standard research fee of 32 kina per day per researcher includes accommodation, use of laboratory, diving equipment and station boats within one nautical mile of the island. Three staff members are always on the island and may assist researchers. To get to the research station you fly into Port Moresby where field station staff can pick you up if you wish via mini-bus and transport you to the Tahira Marine Base where you get on a station boat for the 15 minute trip over to the island. You need to purchase your groceries and supplies before coming out to the station.

As with all research in PNG, you need to have an affiliation with a government institution (e.g., UPNG) and a research visa; MIRD can assist you with these formalities, but you need to apply for your visa at least 6 months prior to your research.

For further information contact: MIRD, University of PNG, Box 320 University PO, Port Moresby NCD, PNG. Campus phone: (675) 326-7381 Campus fax: (675) 326-0369 Motopore Island phone/fax: (675) 325 8093 Email: [jrewald@peg.apc.org](mailto:jrewald@peg.apc.org)

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## 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. I decided to include this section after I got Ross River virus in the field and had no idea what I had. 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?

### Ross River Virus

This virus is found in Australia, New Guinea, and several smaller Pacific islands. Ross River is an alphavirus that causes a disease known as epidemic polyarthrititis (EPA). It is transmitted by at least twelve different species of mosquito. The incubation period is 3 to 10 days and the

disease can start with a measles-like rash on the trunk of the body that goes away on its own. Shortly after that intense joint pain starts; the severity can range from joint stiffness to excruciating pain. It is usually symmetrical and fingers, wrists, elbows, toes, ankles, and knees are most often

involved. Usually symptoms go away on their own after several months although the arthritic symptoms can linger for up to three years. Chronic fatigue and lethargy are common. Most people under 10 years of age or over 65 do not show symptoms. It is most commonly seen in people between 30 to 50 years old. Adult females get this disease more often than males. There is no vaccine or specific treatment for the disease; bed rest and treatment of symptoms with analgesics is recommended.

**Symptoms:**

Rash, severe muscle and joint pain, slight to no fever, fatigue, sore lymph glands

**References:**

Page 690 in the textbook: Tropical and Geographic Medicine Mudge, P.R. Clinical features of epidemic polyarthritis.

Arbovirus Research in Australia 1982:158-66.

<http://floreysci.uq.edu.au/edwards>

## Barmah Forest Virus

This arbovirus was first discovered in people in 1986 (in Australia). It is very similar to Ross River virus.

**Symptoms:**

Muscle and joint pain, fever, headache, rash

**References:**

<http://floreysci.uq.edu.au/edwards>

## Filariasis

Lymphatic filariasis is widespread and extremely common in New Guinea. Worldwide over 120 million people have this disease. It is caused by nematode worms that invade the lymph system and it is spread by mosquito bites. After you are bitten by an infected mosquito it takes 3 to 15 months for the adults to develop in your lymph system. The adults breed and large numbers of larvae (microfilariae) are released. The microfilariae (about 0.3 mm long) stay in your body for 6 to 24 months before they become adults; the microfilariae cause tremendous damage to your system by moving around secreting, excreting and dying (which causes a toxic response from your immune system). The adults (several centimeters in length) live in the lymph ducts and damage them. Untreated this disease can lead to severely swollen extremities ("elephantiasis") because the worms scar the lymph tissue and it can no longer drain fluids as it is supposed to. This is a debilitating disease that gives you frequent headaches and causes you to feel extremely tired all the time. There is an antibody test that has great promise to evaluate filariasis control programs because antibody prevalence declines with microfilariae prevalence (the larval stage of the nematodes). To use the antibody test you only need to get a finger prick blood sample. At the 32<sup>nd</sup> Medical Symposium of the PNG Medical Society in 1996 it was recommended that mass treatment with DEC and/or Ivermectin be carried out in any communities where this disease is found. There is already enough data to show that

the disease is highly epidemic and widespread in the country so that additional surveys should not be needed before implementation of control programs. Treatment will get rid of the larval stages, but you need to keep treating for 8 to 10 years until the adults die (the medicines will not kill them). Also, the damage the nematodes have done to your lymph system cannot be fixed so early treatment is recommended. Treatment should be done on a mass level (treat the whole community). Ideally use Ivermectin (400 mcg/kg body mass) plus DEC (diethylcarbamazine) (6 mg/kg body mass) in a single dose. Do this once a year and you will wipe out 99% of the microfilaria (the adult worms will die of old age after 8-10 years so keep killing the babies every year so you only have to wait for the original adults to die of old age).

Another option is to use DEC-fortified salt instead of table salt (this salt needs to be used daily for 9 to 12 months). If some village members do not want to take the pills, this might be a way to treat them. It is important to treat all of the members of a community if you want to eradicate the disease from that village.

**Symptoms:** extreme fatigue (lethargy, malaise), fevers, constant headaches, pain and swelling of the lymph nodes

**References:**

<http://gopher.worldbank.org/html/hcovp/phnflash/who/who401.html>

<http://www.who.ch/programmes/ctd/act/filaact.htm>

<http://lionfish.jcu.edu.au/dept/phtm/students/ptthesis.htm>

## Dengue Virus

This is another arbovirus found throughout the tropics, including New Guinea. Classical Dengue is characterized by fever, rash, muscle pain, and joint pain; however, a severe form of the disease may have hemorrhagic manifestations (Dengue hemorrhagic fever). This virus is spread by *Aedes* mosquitos which are most active during the day. It strikes both sexes in all age groups, but children are especially vulnerable to Dengue hemorrhagic fever. There is no vaccine or specific treatment for the disease, but you can have a blood test done to look for the virus or antibodies for it to see if that is what you have. It usually lasts about 10 days but complete recovery can take 2 to 4 weeks. There is no

vaccine or cure, but bed rest, fluids, and acetaminophen to reduce the fevers are recommended; avoid aspirin. If the symptoms persist and progress to faintness, shock, and generalized bleeding (if you see blood in the gums around the teeth), suspect Dengue hemorrhagic fever.

**Symptoms:**

Sudden onset, high fever (up to 40°), severe headaches, joint and muscle pain, nausea, vomiting, and rash (which appears 3-4 days after the fever starts)

**References:**

<http://floreysci.uq.edu.au/edwards>

<http://www.cdc.gov/travel/dengfvr.htm>

## Murray Valley Encephalitis Virus

This flavivirus is found in Australia and New Guinea. This disease can lead to coma and death. Wow.

Does anyone have any more information about this disease for a future issue? Please?

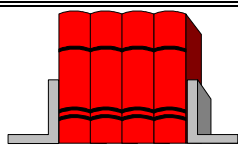
**Symptoms:**

2-5 days of fever, headache, muscle pain, malaise, loss of appetite, nausea, these symptoms are followed by posterior

neck rigidity and neurological signs, in some cases the disease continues to cause coma and death

**References:**

<http://florey.biosci.uq.oz.au/edwards>



## Available Publications

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

**From the Department of Environment and Conservation, Papua New Guinea, United Nations Development Program OPS-PNG/93/G31 Biodiversity Conservation and Resource Management Program:**

Hedemark, M., S. Hamilton and W. Takeuchi. 1997. Report on the First Bismarck-Ramu Biological Survey with Sociological and Logistical Comments. 110 pages.

**From Melbourne University Press, Carlton, Victoria 3053 Australia:**

Womersley, J. S., editor. 1978. Handbooks of the Flora of Papua New Guinea, Volume 1. 278 pages. ISBN 0-522-84095-7.

Henty, E. E., editor. 1981. Handbooks of the Flora of Papua New Guinea, Volume 11. 276 pages. ISBN 0-522-84204-6.

Conn, B. J., editor. 1995. Handbooks of the Flora of Papua New Guinea, Volume 111. 292 pages. ISBN 0-522-84582-7.

**From Unisearch Pty Ltd. at Biology/University of PNG, P.O. Box 320, University Postoffice, NCD, Papua New Guinea (cost K24 plus postage):**

Hopkins, H. F. and J. Menzies. 1995. Flora of Motupore Island.

**From John A. Maturbongs, WWF Biak Yapen, Jaln Bosnik Raya No. 5, P.O. Box 231, Biak, Irian Jaya, Indonesia:**

Maturbongs, J. A., H. Rumaikewi, J. Rumaropen and A. Sangganafa. 1993. Report of Population and Egg Laying Place of Turtles, Observation at Inggresau Beach Yapen Waropen Regency in Irian Jaya.

**From the Biodiversity Support Program c/o WWF, 1250 24<sup>th</sup> Street NW, Washington D.C. 20037 USA:**

Biodiversity Conservation Network 1996 Annual Report: Stories from the Field and Lessons Learned.

**From The Environment Department, OK Tedi Mining Limited, PO Box 1, Tabubil, Western Province, Papua New Guinea:**

Gregory, Phil. 1995. The Birds of the OK Tedi Area. 42 pages. National Library of Papua New Guinea ISBN 9980-916-13-3

## Scientific Literature



This issue we are including a listing of the papers from two NG journals: "Science in New Guinea" from 1990 through present and "Muruk" from its beginning through 1995. 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 among all of us. If you have more than one page of citations, please send your list on disk (preferably 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't find it for you and send it to you. (Not just the citations in the newsletter, you can request any citation).

**Wim Vink-- Publication on NG flora**

Vink, W. 1995. Revision of *Magodendron* (Sapotaceae) with observations on floral development and morphology. *Blumea* 40:91-107.

**Gary Dodson-- Publications on Antler Flies**

Dodson, G.N. 1997. The resource defense mating system of antler flies, *Phytalmia* spp. *Annals of the Entomological Society of America* 90:496-504.

Wilkinson, G. and G.N. Dodson. 1997. Function and evolution of antlers and eye stalks in flies. Pp. 310-328 *in*: *The Evolution of Mating Systems in Insects and Arachnids*. Choe, J.C. and B.J. Crespi (eds.). Cambridge University Press.

**Debra Wright-- Publication on NG flora**

Wright, D.D., J.H. Jessen, P. Burke, and H. Gomez de Silva Garza. 1997. Tree and liana enumeration and diversity on a one-hectare plot in Papua New Guinea. *Biotropica* 29:250-260.

**Science in New Guinea**

This journal is published by the University of Papua New Guinea. Each year it also includes the abstracts from papers given at the annual New Guinea Biological Society Meeting (usually held in August or September each year, it alternates being held in Irian Jaya or PNG). Rates range from K20 to K50 per volume depending on the cost of postage (local or overseas). For more information or to subscribe and get the journal, write to the editor : James Menzies, University of Papua New Guinea, Department of Biology, P.O. Box 320, University PO, NCD, Papua New Guinea

**1990 Volume 16**

- Hortle, K.G., D. Balloch and A. Y. Maie. Marine benthic fauna, sediment and trace metals near Daru Island, Papua New Guinea. Page 1.
- Smith, J.M.B. Environmental change on Mt. Wilhelm. Page 13.
- Betitis, T. and M. Sullivan. Late Holocene sedimentation in Mirigeda embayment, Central Province, Papua New Guinea. Page 22.
- Horiguchi, K. and H. Sakulas. A medicinal plant database of Papua New Guinea. Page 31.
- Kerenga, K. Vegetation of the Vanimo area of Papua New Guinea. Page 35.
- Gideon, O.S. Book Review of E. Robbrecht: Tropical Woody Rubiaceae: Characteristic Features and Progressions; Contribution to a New Subfamilial Classification. Page 39.
- Hopkins, H.F. Book Review of R.J. John: The Flowering Plants of Papuasia. Page 41.
- Hopkins, H.F. Book Review of O.W. Borrell: An Annotated Checklist of the Flora of Kairiru Island, New Guinea. Page 41.
- King, G.A. and C. Hackett. Use of a geographic information system with a crop modeling system in a rapid rural appraisal in Papua New Guinea. Page 46.
- McLeish, M.J. and J.L. Huang. A comparison of alkaloid levels in the nuts of *Arcea catechu* Linn. Page 55.
- Agyeman, K. and D. Yeboah-Amankwah. Characteristics of solar radiation at two locations in the Port Moresby area, Papua New Guinea. Page 61.
- Erfteimeijer, P.L.A. and G.R. Allen. Intertidal macrobenthic fauna and fish predators in Bintuni Bay, Irian Jaya (Indonesia). Page 70.
- Kaluwin, C. Determination of aflatoxins in Papua New Guinea and Australian foodstuffs by high performance liquid chromatography. Page 78.
- Menzies, J.I. Notes on spiny bandicoots, *Echymipera* sp., (Marsupialia, Peramelidae) from New Guinea and description of a new species. Page 86.
- Matsuoka, T., T. Sigabane, and J. Kasu. A comparison of selectivity of gillnet and trammelnet. Page 100.
- Fairfax, R. A new species of *Neopolystoma* (Monogenea) and the occurrence of *Polystomorides* sp. in New Guinea with notes on some polystomes from north-east Australia. Page 109.
- Rali, T. and K. Solien. Chemical study of a soft coral (*Lobophytum* sp.). Page 115.
- Menzies, J.I. A systematic revision of *Pogonomelomys* (Rodentia: Muridae) of New Guinea. Page 118.

**1991 Volume 17**

- Tan, T.T. and T. Taniuchi. Occurrence of the Bull Shark, *Carcharhinus leucas* in the Sepik River. Page 3.
- Jebb, M. An account of *Nepenthes* in New Guinea. Page 7.
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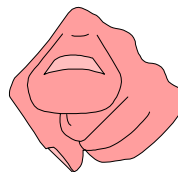
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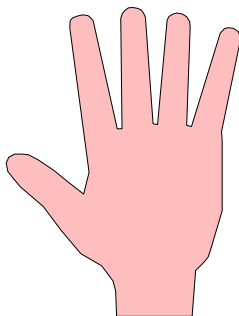
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Included with this issue of the Digest, you will find corrections and additions to the 1997 directory; a new directory will be sent out in March 1998. We hope this will facilitate communication between all of us. Please help us by sending the names and addresses of anyone else who would like to get a copy of the Digest. Also, please check your address, phone, fax, and e-mail. If anything is wrong, please drop us a line so we can correct it. If you would rather not receive the newsletter, please let us know so we can save the paper and postage. Thanks!



Goodbye until next time!

Lukim yu bihain!

Sampai jumpa lagi!