Communities of leaf-chewing insects in rainforests of New Guinea:

Story of the parataxonomists' conquest of the tropical ecology

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Parataxonomist Training Center, Madang, PNG

Who is the Parataxonomist?

para - taxonomist

- encyclopedical knowledge of the environment
- interest in biology
- talent and willingness to educate themselves

Who is the
Parataxonomist?

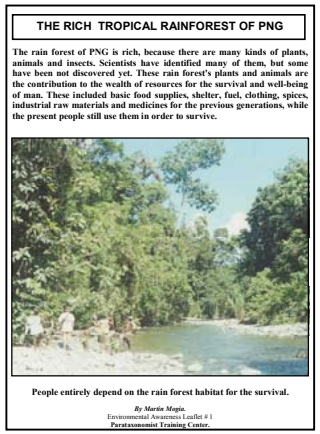
- entomology in practice
- working with computer
- digital imaging
- broad scientific context

Papua New Guinea
Costa Rica
Guyana
Gabon

Who is the Parataxonomist?

Awareness programs

- school lectures (audience 1400+)
- leaflets production and distribution (30+ leaflets, hundreds of reprints)

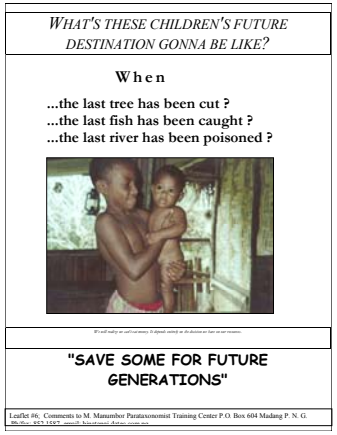


THE RICH TROPICAL RAINFOREST OF PNG

The rain forest of PNG is rich, because there are many kinds of plants, animals and insects. Scientists have identified many of them, but some have been not discovered yet. These rain forest's plants and animals are the contribution to the wealth of resources for the survival and well-being of man. These included basic food supplies, shelter, fuel, clothing, spices, industrial raw materials and medicines for the previous generations, while the present people still use them in order to survive.

People entirely depend on the rain forest habitat for the survival.

By Martin Megia.
Environmental Awareness Leaflet # 1
Parataxonomist Training Center.



WHAT'S THESE CHILDREN'S FUTURE DESTINATION GONNA BE LIKE?

When

...the last tree has been cut ?
...the last fish has been caught ?
...the last river has been poisoned ?

We will really or sad real misery. It depends entirely on the decision we have on our resources.

"SAVE SOME FOR FUTURE GENERATIONS"

Leaflet #6; Comments to M. Manumbor Parataxonomist Training Center P.O. Box 604 Madang P. N. G.

The P.T.C.‘s machinery of leafchewers research

- plant selection
- collecting
- rearing
- mounting
- morphotyping
- databasing
- taxonomy
- analysis

plant selection

collecting

89 species of plants

rearing

Ecological characteristics

mounting

- primary x secondary
- forest, coastal, riverine species

morphotyping

Phylogeny (taxonomy) of hosts

databasing

- congeneric, confamilial, alofamilial species
- molecular phylogeny

taxonomy

analysis

plant selection

collecting

rearing

mounting

morphotyping

databasing

taxonomy

analysis

village collaborators

sampling effort recorded

plant selection

collecting

rearing

mounting

morphotyping

databasing

taxonomy

analysis

Daily feeding and cleaning

Diseases avoiding

plant selection

collecting

rearing

mounting

morphotyping

databasing

taxonomy

analysis

plant selection

collecting

rearing

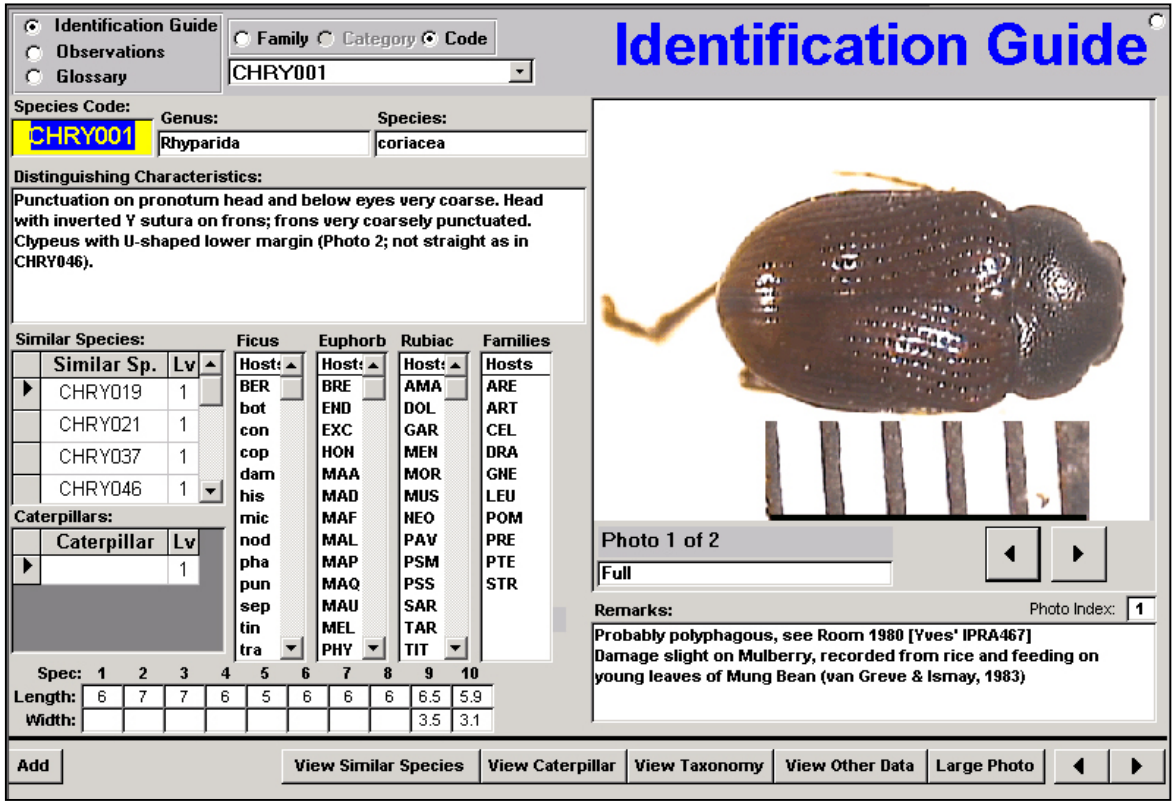
mounting

morphotyping

databasing

taxonomy

analysis



plant selection

collecting

rearing

mounting

morphotyping

databasing

taxonomy

analysis

Sp. Code	Host	#	Locality	Date	Accession	Caterpillar	Observer	Remarks
PYRA006	AMA	1	Ohu	28-Jul-98	66152	CATR026	Frank	
CRAM046	NEO	1	Ohu	26-Aug-98	66153	DCATR060	Frank	
URAN005	DOL	1	Baitabag	26-Aug-98	66154	DCATR092	Ulai	orig. GEOM052
CRAM034	MUS	1	Mis	20-Aug-98	66155	DCATR023	Michael	
CRAM044	AMA	1	Ohu	8-Jul-98	67014	CATR026	Kevens	orig. Pyra007
TORT034	NEO	1	Ohu	26-Aug-98	67015	DCATR015	Kelly	orig. TORT069
CRAM044	AMA	1	Ohu	22-Jul-98	66059	CATR026	Tatau	orig. Pyra007
CRAM044	AMA	1	Ohu	22-Jul-98	66579	CATR026	Tatau	orig. Pyra007
PYRA006	AMA	1	Ohu	8-Jul-98	66209	CATR026	Kevens	
CHOR008	MAQ	1	Ohu	27-Aug-98	66210	DCATR094	Frank	
PYRA006	AMA	1	Ohu	25-May-98	66837	CATR026	Kevens	
CRAM044	AMA	1	Ohu	28-Jul-98	67119	CATR026	Kelly	orig. Pyra007
PYRA006	AMA	1	Ohu	28-Jul-98	64212	CATR026	Frank	
CRAM041	PSS	1	Mis	22-Jun-98	66435	CATR003	Aisak	M. KAY
CRAM041	PSS	1	Nagada	19-Jun-98	64246	CATR003		M. KAY
CRAM044	PSL	1	Mis	22-Jun-98	66600	CATR003	Michael	orig. PYRA007
CRAM041	PSM	1	Ohu	8-Jul-98	66700	CATR003	Kevens	M. KAY
CRAM044	PSL	1	Mis	2-Jun-98	64355	CATR003	Michael	orig. PYRA007
CRAM044	PSL	1	Mis	22-Jun-98	66362	CATR003	Aisak	orig. PYRA007
CRAM044	PSL	1	Mis	22-Jun-98	67084	CATR003	Aisak	orig. PYRA007
CRAM041	PSM	1	Mis	10-Jun-98	67246	CATR003	Aisak	M. KAY
CRAM041	PSL	1	Mis	10-Jun-98	66398	CATR003	Richard	M. KAY
CRAM041	PSL	1	Mis	11-Jun-98	67252	CATR003	Michael	M. KAY
CRAM041	PSL	1	Mis	29-Jun-98	67267	CATR003	Bari	M. KAY
PYRA006	AMA	1	Ohu	22-Jul-98	67153	CATR026	Kelly	
CRAM044	AMA	1	Ohu	8-Jul-98	64202	CATR026	Kevens	orig. Pyra007

Lepidoptera - 43,000

Coleoptera - 25,400

Orthopteroids - 8,300

Auchenorhyncha, Scolytidae, Fruits

plant selection

collecting

rearing

mounting

morphotyping

databasing

taxonomy

analysis

Digital and classical photography

plant selection

collecting

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Department of Environment and Conservation, PNG

↓

National Museum of Natural History,
Smithsonian Institution, Washington, USA

↓

experts

↓

National Insect Collection
at the National Research Institute, PNG

plant selection

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Most herbivores have wide host plant ranges,
especially within **host genus**

The overlap between herbivore communities **decreased gradually** with increasing phylogenetic distance between hosts

our data + other improved paramteres =

New Estimation Of Global Arthropod Diversity

4.9 million species

Nature

Journal of Ecology

Oikos

Journal of Animal Ecology

plant selection

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The P.T.C.'s machinery of leafchewers research

- **2,500** person-days of fieldwork
- **89** tree species surveyed
- **86,000** feeding insects sorted into **1,200** species
- **21,000** caterpillars successfully reared to adults
- over **50,000** insects pinned
- over **3,500** digital pictures on WWW

The P.T.C.‘s additional projects

Cerambycidae

fruit flies

scolytidae

rainforest ants

The P.T.C.'s additional projects

cerambycidae

highlands' fics

fruitflies

scolytidae

rainforestants

Methods

tree poisoning

timber collecting

rearing in extractors

The P.T.C.'s additional projects

cerambycidae

highlands' fics

fruitflies

scolytidae

rainforestants

Analysis

community structure

specificity to hosts' phylogeny

specificity to host attractants

bionomy

The P.T.C.'s additional projects

cerambycidae

highlands'fics

fruitflies

scolytidae

ants

Methods

hand-collecting

ground samples

pit-fall trap

bait-trap

Analysis

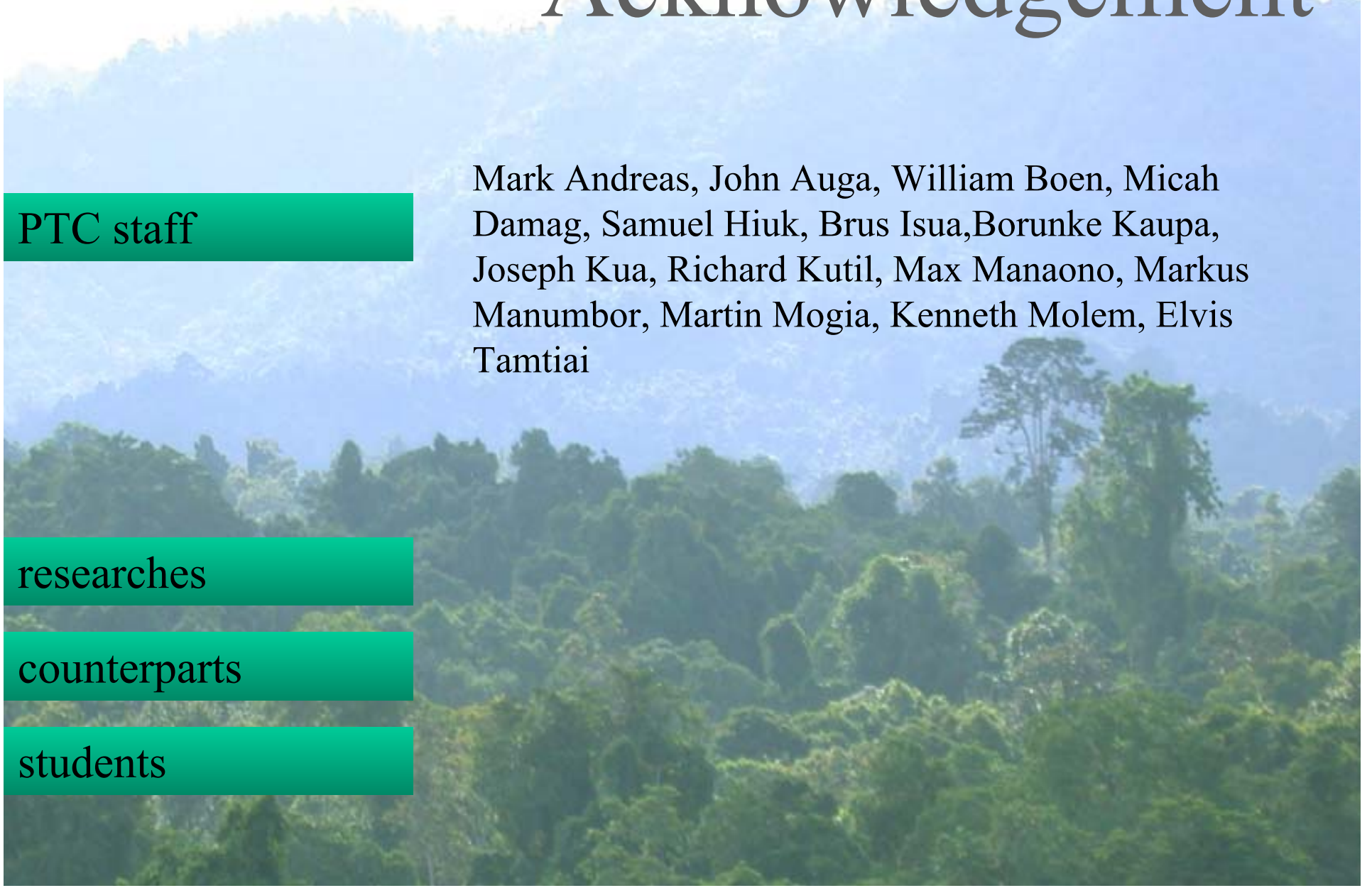
community structure

α, β-diversity

forest type

influence of disturbance

Acknowledgement



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researches

counterparts

students