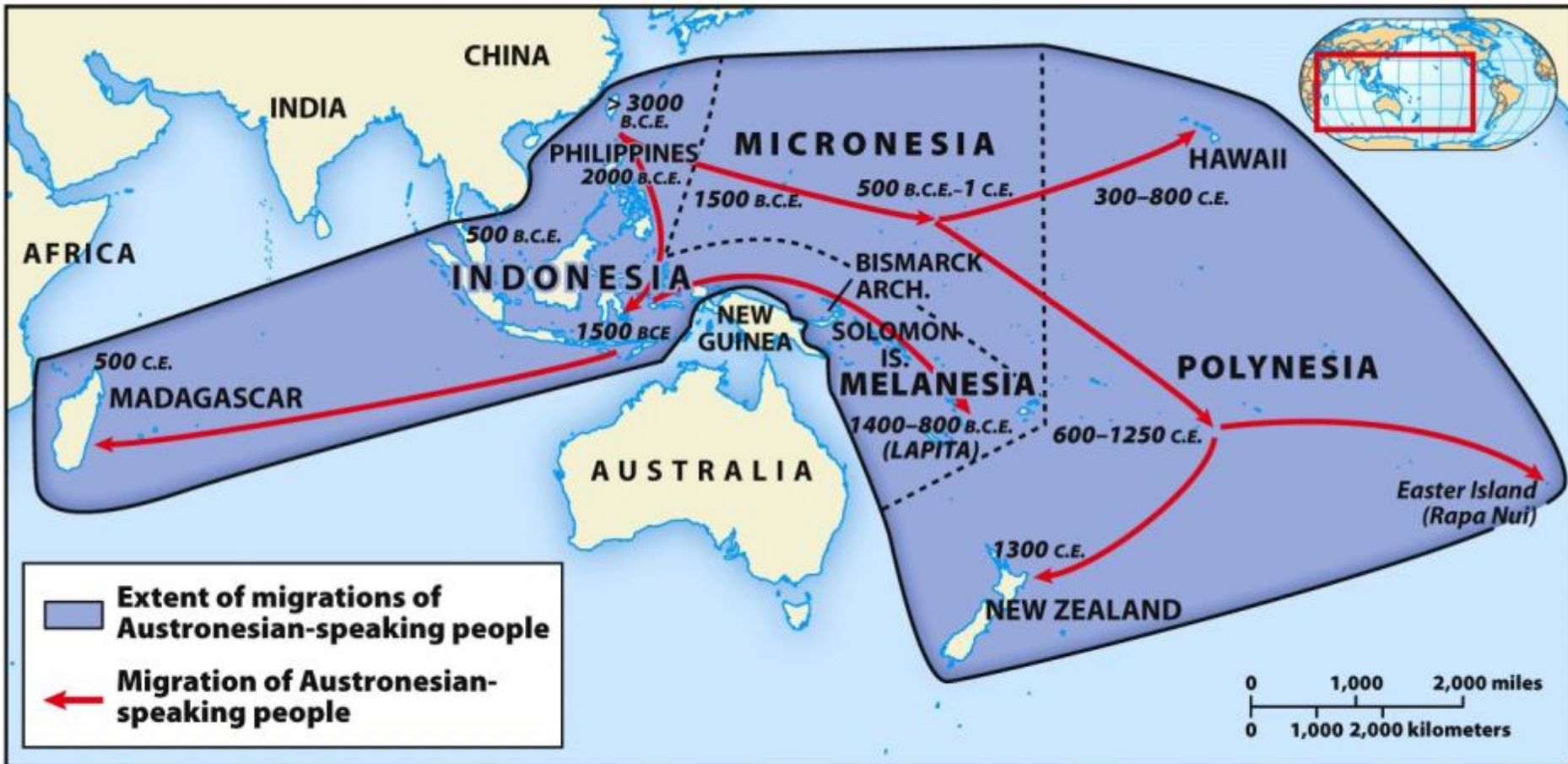


# **BAKAU & PERADABAN BESAR AUSTRONESIA: KAJIAN ETNOBIOLOGI**

**ARY PRIHARDHYANTO KEIM  
(ETNOBIOLOG)**



**KELOMPOK PENELITIAN ETNOBIOLOGI  
PUSAT PENELITIAN BIOLOGI, LEMBAGA ILMU PENGETAHUAN INDONESIA  
JAKARTA, 21 JULI 2020**

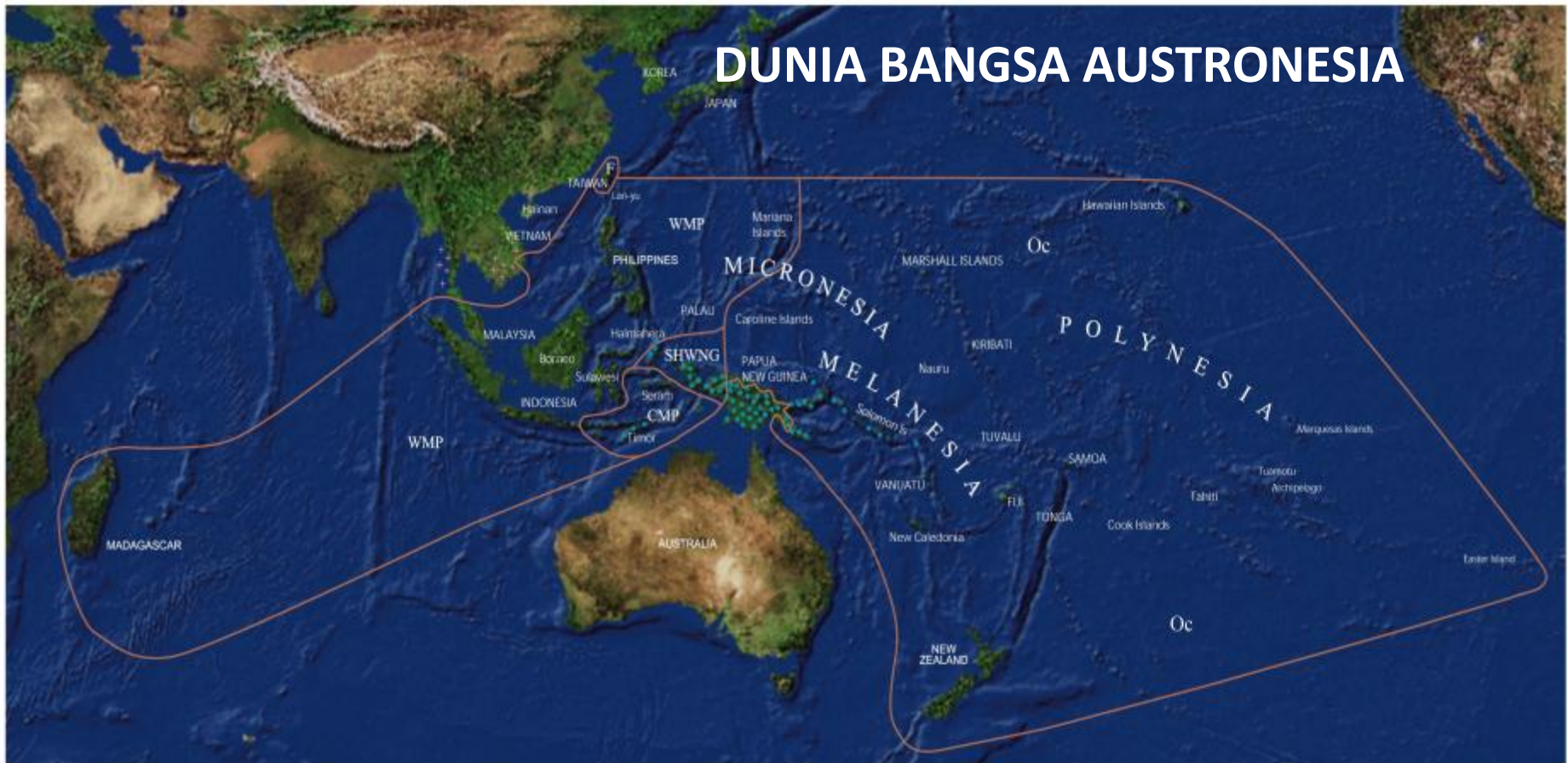


Map 1.2 Migration of Austronesian-Speaking People  
 Chapter 1, *Ways of the World: A Brief Global History*, Second Edition and  
*Ways of the World: A Brief Global History with Sources*, Second Edition  
 Copyright © 2013 by Bedford/St. Martin's  
 Page 19 (page 19, *With Sources*)

## BANGSA AUSTRONESIA = BANGSA NUSANTARA

- Bangsa **Austronesia** = bangsa besar yg wilayahnya dibatasi **Madagaskar** di barat, Pulau **Paskah** di timur, bagian **selatan Jepang** di utara & **Selandia Baru** di selatan. \
- Semenjak awal (ca. **25.000 SM**) sudah merupakan bangsa peradaban **amfibi** = sama baik di darat & laut.
- Tanah leluhur Austronesia = **Paparan Sunda (Sundaland)** = sebuah anak benua yg ada saat jaman es ke-3.
- Saat jaman es ke-3 berakhir (**11.000-10.000 SM**), sebagian besar bagian anak benua tsb **tenggelam** & bangsa Austronesia mulai berlayar luas = penjelajahan ke Samudera Hindia & Pasifik = membawa peradaban mereka.

# DUNIA BANGSA AUSTRONESIA



## Key to the Austronesian Language Map

- F Formosan Languages
- ++ WMP Western Malayo-Polynesian Languages
- CMP Central Malayo-Polynesian Languages
- SHWNG South Halmahera West New Guinea
- Oc Oceanic Languages
- \*\*\* Papuan Languages

## Structure of the Austronesian Language Family

- AN Austronesian Language Family
- F Formosan Languages
- MP Malayo-Polynesian Languages
- WMP Western Malayo-Polynesian Languages
- CMP Central Malayo-Polynesian Languages
- EMP Eastern Malayo-Polynesian Languages
- SHWNG South Halmahera West New Guinea
- Oc Oceanic Languages

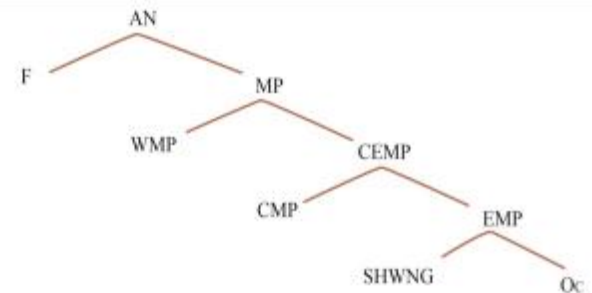


Figure 1  
 Distribution of the Austronesian Language Family and Major Subgroupings. Adapted from the Research School of Pacific and Asian Studies,  
 National Australian University. Structure of the Austronesian Language Family from Blust.

# AWAL PERADABAN MARITIM NUSANTARA



### Ethnoastronomy: The Sundanese of West Java and their Relation to Ethnoastronomy

Suhartja D. Wismardjaja  
Former Visiting Research Fellow

**Introduction**

Nothing in nature has intrigued humans more than gazing at a speck of light in the sky. While all people on Earth have observed the same primitive objects in the sky, the taboos, myths, and stars of cultures have developed their own interpretations of these heavenly bodies within different cultural contexts. There are many different ways in which people have woven concepts and knowledge of the phenomena and objects they watched into the fabric of their lives. But it is important to realize that in most cultures there was nothing that was thought of as "astronomy." The phenomena and objects in the sky were merely part of the whole complex of the surrounding world. I use the word astronomy for anything related to what we think of as astronomy in our present context. This article is a preliminary exploration of the Sundanese, an ethnic group in West Java and how they express their perceptions of the universe through ethnoastronomy, the study of knowledge, interpretation, and practices regarding celestial objects or phenomena of specific cultures.

Knowledge of the stars by artists' constellation was indeed common in many ethnic groups inhabiting the Indonesian archipelago. Many studies have already been conducted especially in Central Java and Bali. But to date, only a few have been done in West Java – sometimes known as Lower Sundaland (the land of Sundaland for local people). Some of them were written by Santandjaja (1981) from Bandung and Ignatius Sabatka (1981, 1982, and 1983). Much more material exists which has yet to be clearly researched and documented. For instance, there have been more to better document Asia's relationship to ethnoastronomy!

**Sundanese and their Relationship to Time**

In the past the Sundanese used natural indicators in order to spend their time to determine or to mark the time of the day. This was based on natural phenomena through what they felt, saw or heard, and in tandem with the effect of the sun's position. They used terms which corresponded to specific times of the day, for example, such as *lilana lumrah* (sunset) – period of time *lumrah* – dark for around 40 to 45 m. *lilana lumrah* (sunset) (period of time) after midnight for 1.5 to 2 m, and so on. Other terms indicating time were used based on what they felt. *lilana lumrah* (sunset) (sunset) means – sunshining means the time of day when it begins to warm or cool for sunbathing at around 08:00 a.m. These indicators are a form of many which were applicable throughout the area the Sundanese live near the equator and the line of sunset and length of twilight are approximately the same all year round! These indicators (more than 20 in number) in order to segment smaller parts of time segments of a 24 hour day segmented into the morning, noon, afternoon, and evening respectively.

For example, in Suburung, a small village in a hilly area about 10 kilometers to the south of Bandung city, people still use these time indicators in their daily social life. In conversations among locals in expressing something related to the ritual of *lilana lumrah* at night they will say "lilana lumrah" and length of twilight are approximately the same all year round! These indicators (more than 20 in number) in order to segment smaller parts of time segments of a 24 hour day segmented into the morning, noon, afternoon, and evening respectively.

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Photo shows a Sundanese tower in the lower Sundaland region in West Java and length of twilight are approximately the same all year round! These indicators (more than 20 in number) in order to segment smaller parts of time segments of a 24 hour day segmented into the morning, noon, afternoon, and evening respectively.

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Kusuma et al. BMC Genomics (2015) 16:191  
DOI 10.1185/s12864-015-1394-7

BMC Genomics

RESEARCH ARTICLE Open Access

### Mitochondrial DNA and the Y chromosome suggest the settlement of Madagascar by Indonesian sea nomad populations

Padmapati Kusuma<sup>1\*</sup>, Murray P. Cox<sup>2</sup>, Denis Pierron<sup>3</sup>, Hariyanto Roesli<sup>4</sup>, Nicolas Bruce<sup>5</sup>, Laure Tonasso<sup>6</sup>, Helena Lou Snyders<sup>7</sup>, Thierry Lefebvre<sup>8</sup>, Herawati Sudoyo<sup>9</sup> and François-Xavier Ricard<sup>10</sup>

\*Correspondence: kusuma@itb.ac.id

- Sudah ada peradaban besar di **Sundaland (25.000-10.000 SM)** = Dibuktikan oleh keberadaan “piramida” **Gunung Padang** di Garut yg setelah di *carbon dating* ca. **10.000 SM!**
- Setelah jaman es ke-3 berakhir, **Sundaland tenggelam** = Dimulai pelayaran samudera secara **bergelombang** hingga ke Madagaskar & Pulau Paskah (*Easter Island*).
- Hanya dimungkinkan dgn penguasaan astronomi & biogeografi maritim yg sangat **baik**.

# BANGSA AUSTRONESIA & PELAYARAN DUNIA

- Penemuan terbesar bangsa Austronesia yg memungkinkan pelayaran samudera = **Perahu bercadik** (*outrigger boats*) dgn layar persegi empat.
- Sudah ditemukan bahkan saat masih di **Sundaland** (ca. 25.000 – 11.000 SM).
- Sebagian besar pelayaran pantai ke pantai, bakau ke bakau = **Logistik** = Bahan makanan & **air tawar**.
- Jalur penjelajahan samudera ditemukan = Dasar perniagaan maritim Nusantara = **Poros Maritim** Nusantara = Produk2 utama **rempah2** khas Nusantara, pertukaran ilmu & pengkayaan budaya.
- Pengetahuan terkait habitat pantai, bakau & kelautan di Austronesia secara umum **sama**.





Basra

China

Berenike

Arabia

India

Ts'uan-chou

Kuang-chou

Tongking

Barygaza

Adulis

Muziris

Oc-eo

Sanfotsi



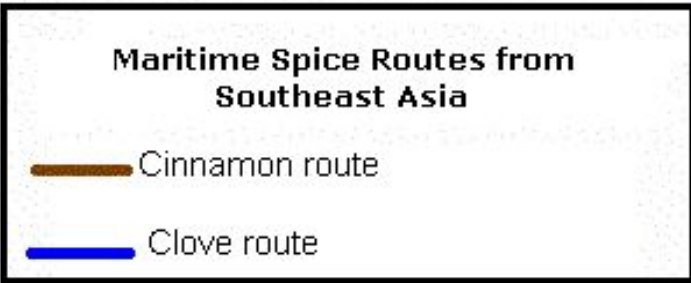
Po-sse ships

Srivijaya

Rhapta

Djavaka

Nusantara



- Selama ribuan tahun perniagaan rempah dikuasai pelaut2 & pedagang2 **Nusantara** hingga masa kerajaan2 besar seperti Sriwijaya & Majapahit.
- Sebagian besar pelayaran dgn perahu bercadik dgn cara menyururi garis2 pantai ("melipir") dari pantai ke pantai, terutama di mana **bakau** ditemukan = sumber logistik **makanan** & **air tawar**.

# BANGSA AUSTRONESIA & BAKAUNYA

- Bangsa Austronesia & Melanesia tidak asing dgn bakaunya & menjadi bagian dari peradabannya.
- Bangsa Austronesia diyakini sudah mengenal bakau & pemanfaatannya bahkan semenjak masih di Sundaland (25.000 – 11.000 SM).
- Di kawasan Sundaland & Sahulland evolusi bakau khususnya **Rhizophoraceae** mencapai puncaknya, di mana 4 marga utama *cohabitant & diverse* = **Bruguiera**, **Ceriops**, **Kandelia** & **Rhizophora**.
- Selain itu ada marga2 & suku2 lain yg jg penting = **Avicennia** (Acanthaceae), **Lumnitzera** Combretaceae) & **Sonneratia** (Lythraceae).
- Jenis2 bakau memiliki manfaat mulai bahan bangunan & kapal sampai makanan & obat2an = Penyedia **logistik** sangat penting utk **pelayaran**.
- Jenis2 **Rhizophora**, **Bruguiera** & **Ceriops** = potensi obat2 luka (*inflammatory*), mata, *anti bacteria* & bahkan *anti virus* = Banyak spp yg berpotensi utk penanganan Covid 19.
- Bakau sangat penting bagi **peradaban Austronesia** hingga banyak nama & terminologi terkait bakau yg sama di segenap peradaban Austronesia = Peradaban Austronesia bermula di bakau!
- Nama “**bakau**” misalnya = bakau/bako (Indonesia), bakhaw (Cebu, Ph), bakawan/bakaw (Filipino, Ph), makaukau (Hawaii), honko (Madagascar), paakau (Maori, NZ), mako (Fiji).





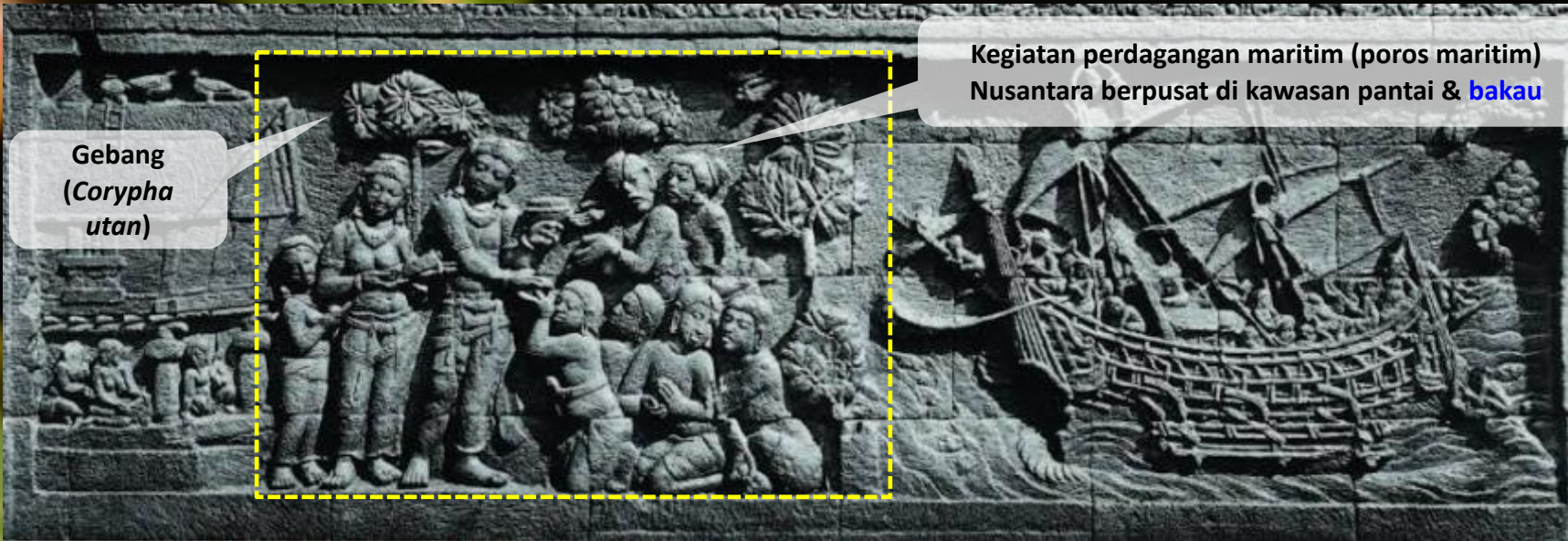
Bahan pewarna kain bangsa **Austronesia**, khususnya **Indonesia** sebagian besar dari spp tumbuhan **bakau**.



- Bakau spp ***Rhizophora mucronata*** & ***R. apiculata*** sbg bahan pewarna **batik**.
- **Home industry** di banyak tempat di Jawa, spt Purwokerto & Cilacap = Bakau dari Segara Anakan.
- Bakau sdh dipakai sbg pewarna pakaian oleh bangsa Austronesia selama ribuan tahun = termasuk di pakaian2 bangsa2 di **Pasifik** = Polynesia & Micronesia.

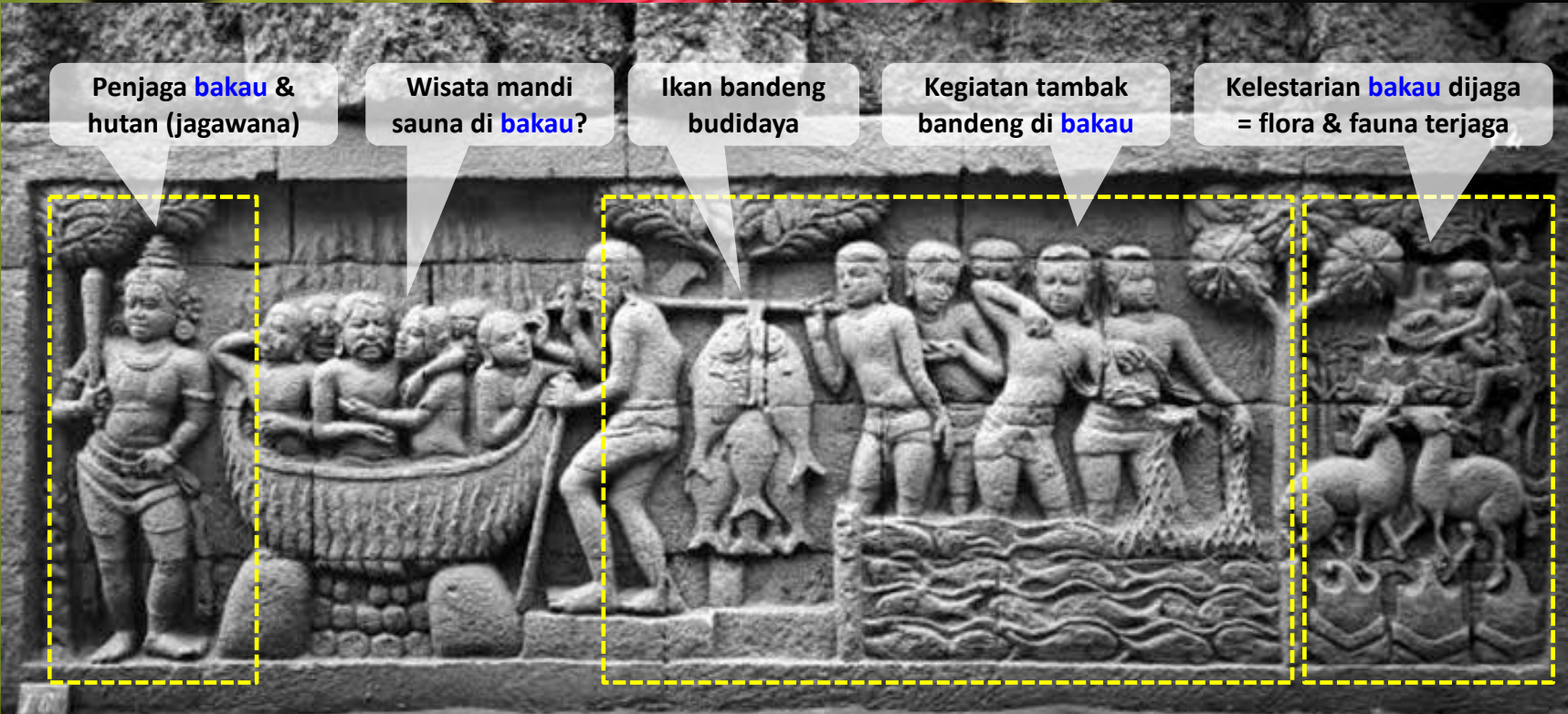






Gebang  
(*Corypha  
utan*)

Kegiatan perdagangan maritim (poros maritim)  
Nusantara berpusat di kawasan pantai & bakau



Penjaga bakau &  
hutan (jagawana)

Wisata mandi  
sauna di bakau?

Ikan bandeng  
budidaya

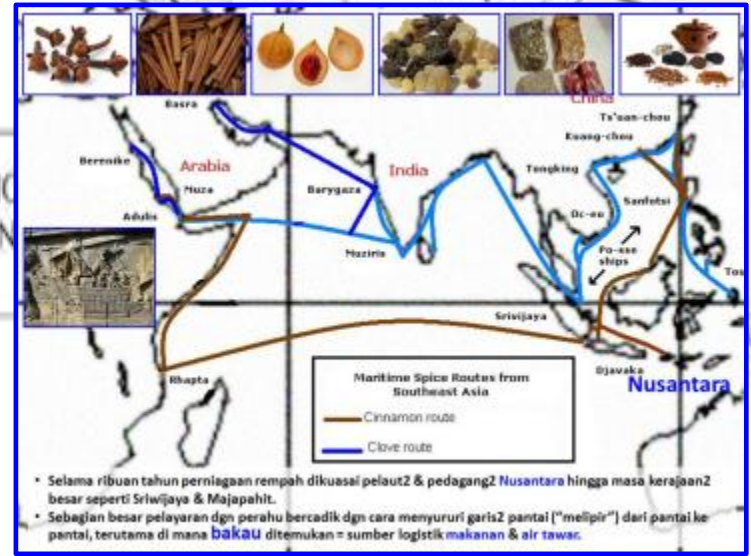
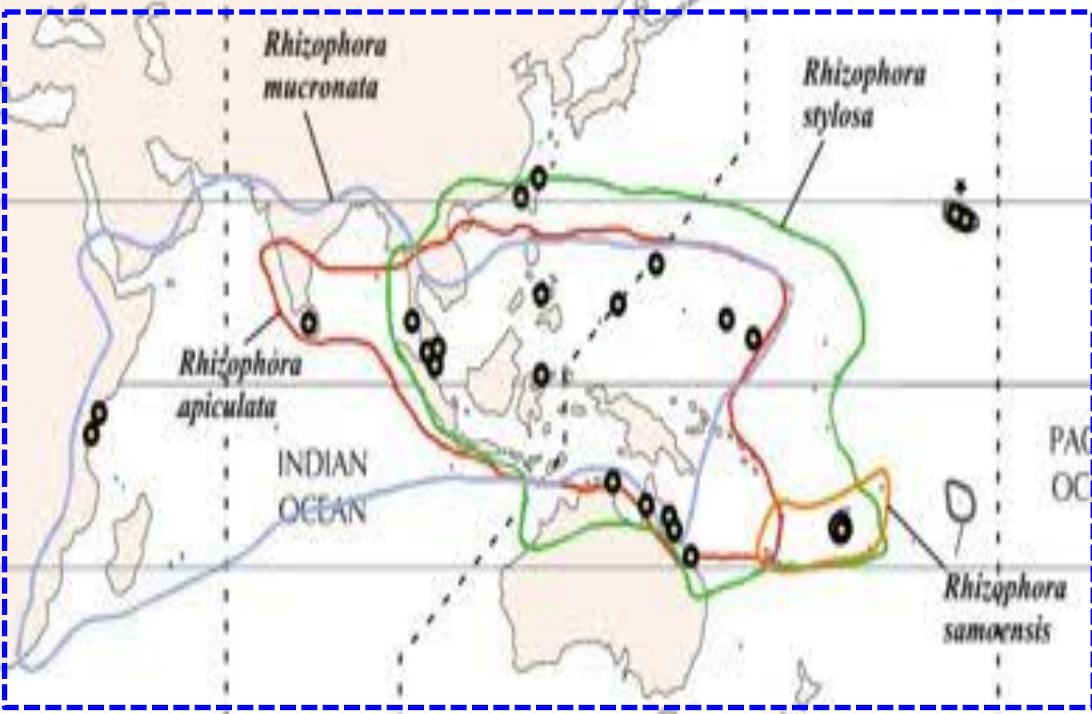
Kegiatan tambak  
bandeng di bakau

Kelestarian bakau dijaga  
= flora & fauna terjaga

# PERSEBARAN BAKAU & PERGERAKAN PELAYARAN BANGSA AUSTRONESIA



Ada kaitan yg kuat antara peradaban bangsa Austronesia & bakau-nya



Bangsa Austronesia berlayar mengikuti persebaran bakau = Logistik terutama pangan, obat & air tawar.

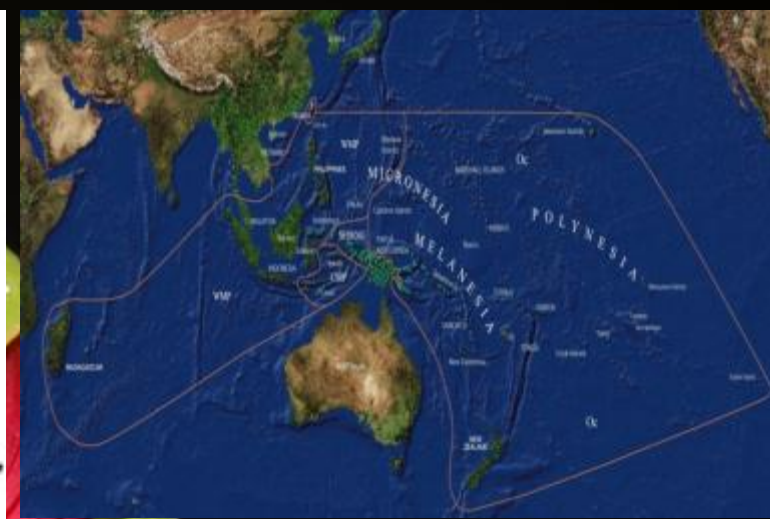
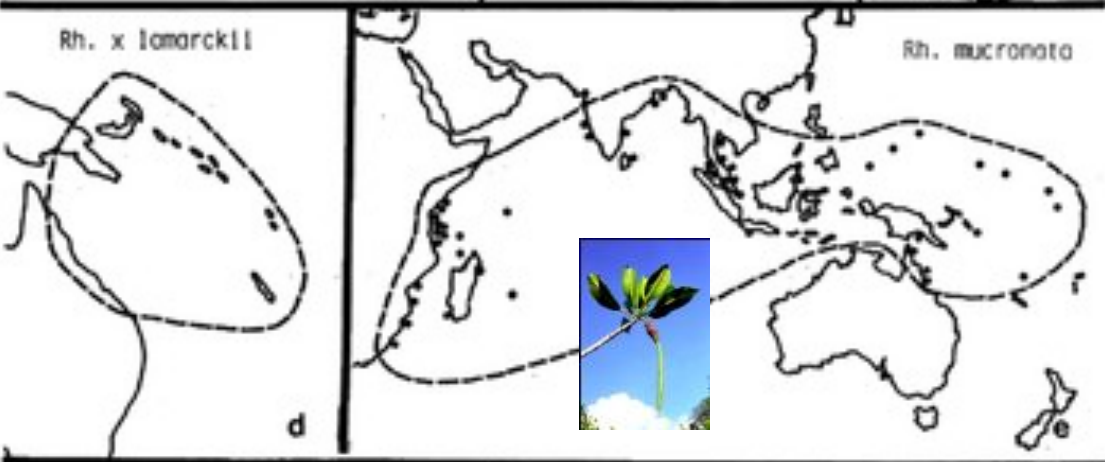
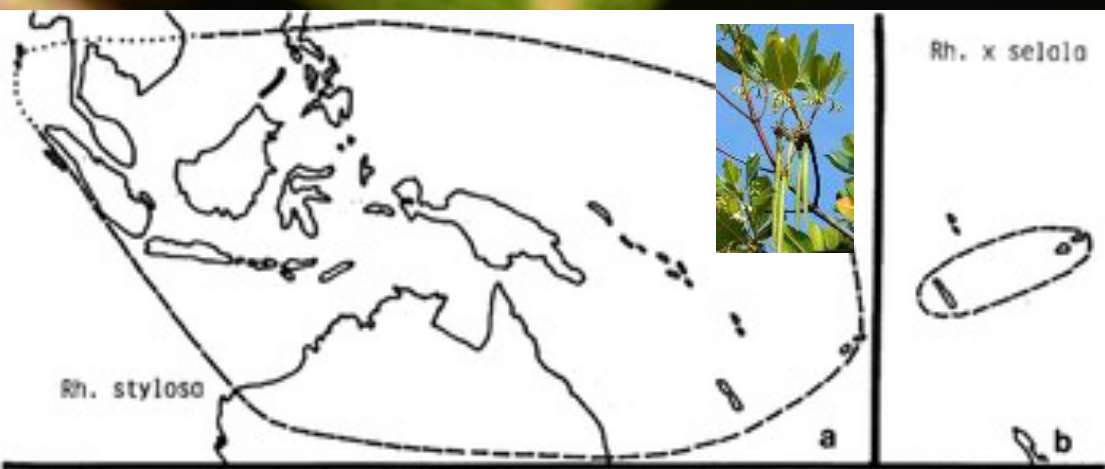
E-Africa Indo-Malesia Australasia

W-America E-America W-Africa

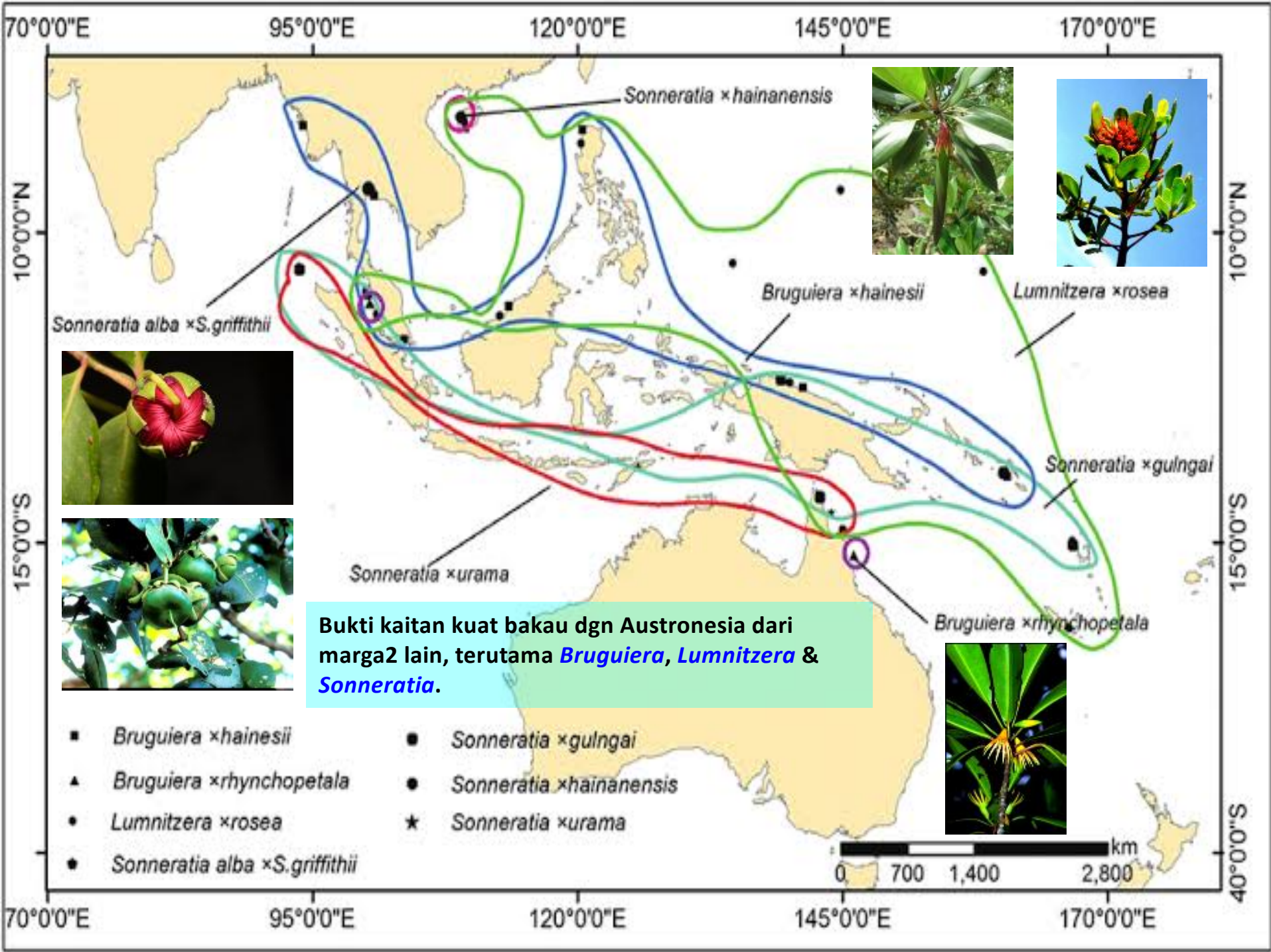
Wilayah peradaban AUSTRONESIA identik dgn persebaran BAKAU khususnya Rhizophora = BANGSA BAKAU = BANGSA RHIZOPHORA

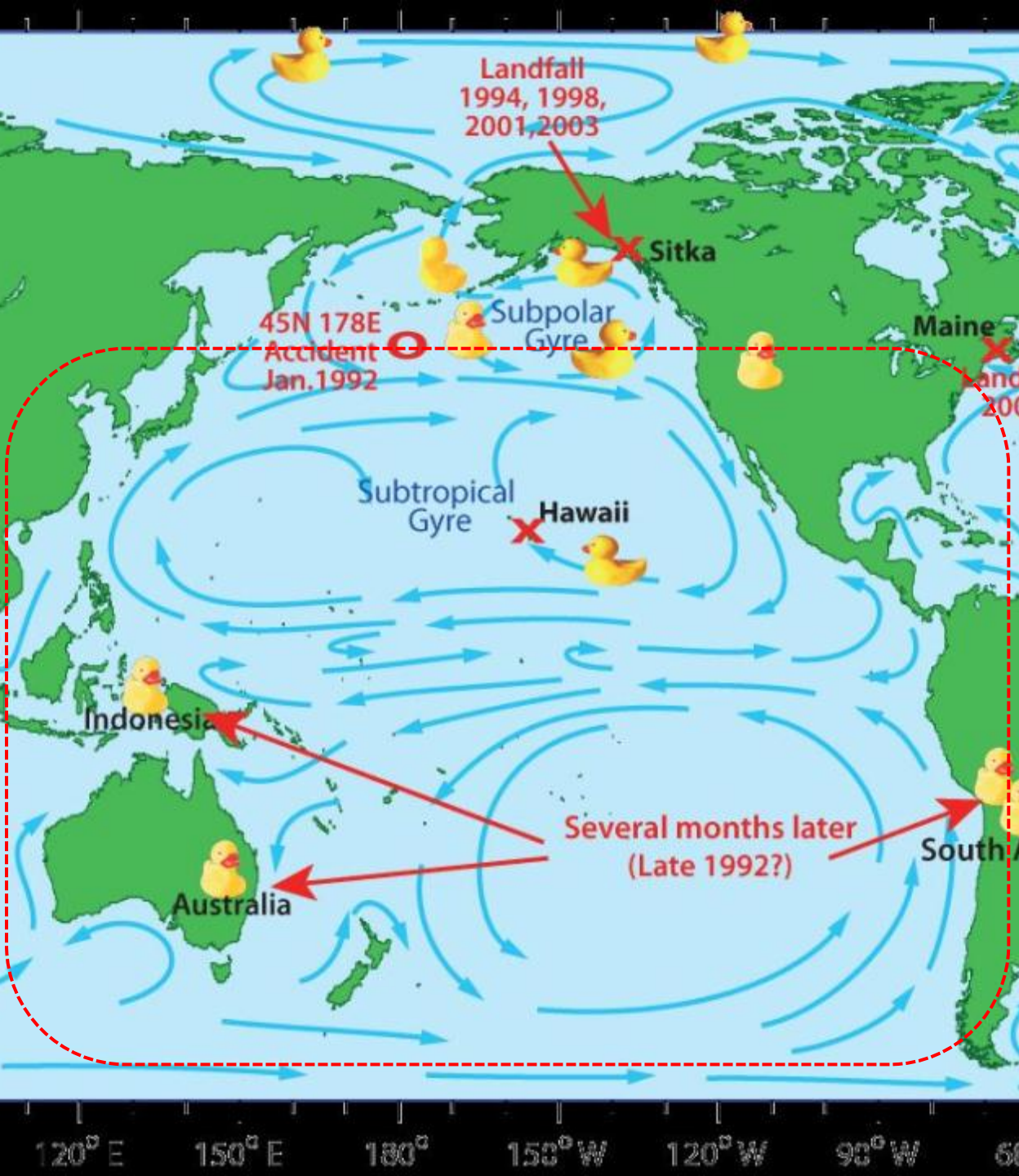
INDO WEST PACIFIC

ATLANTIC EAST PACIFIC

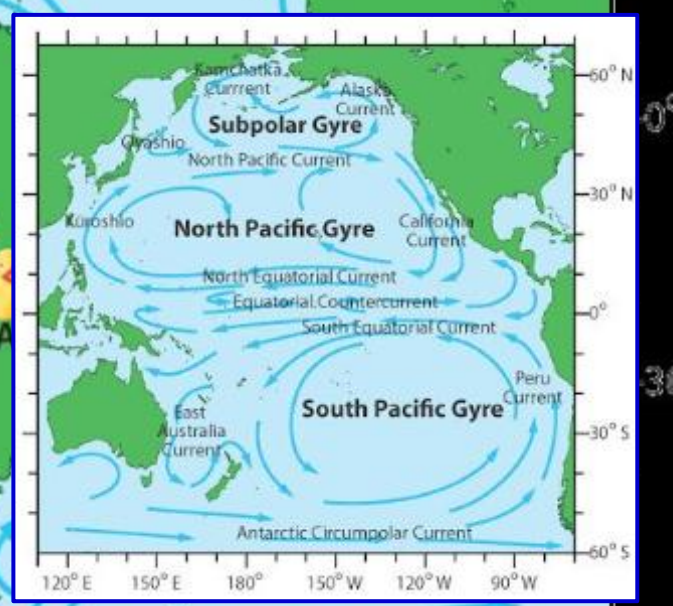


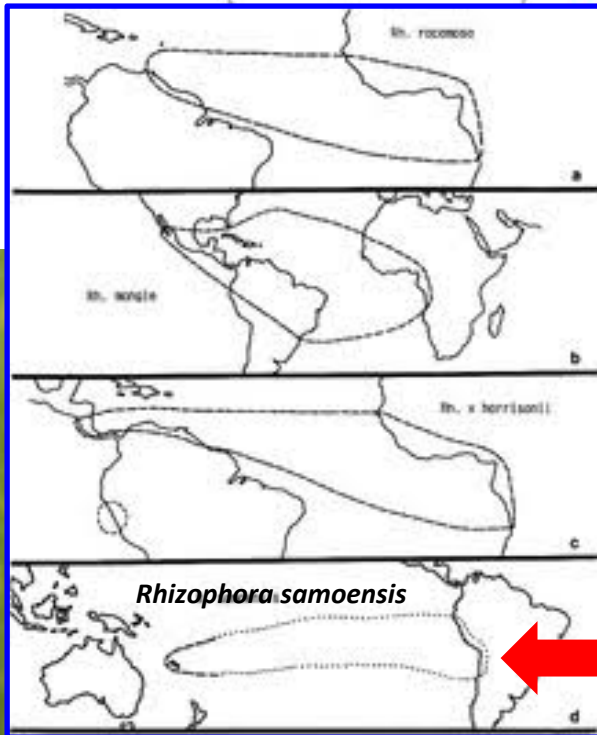
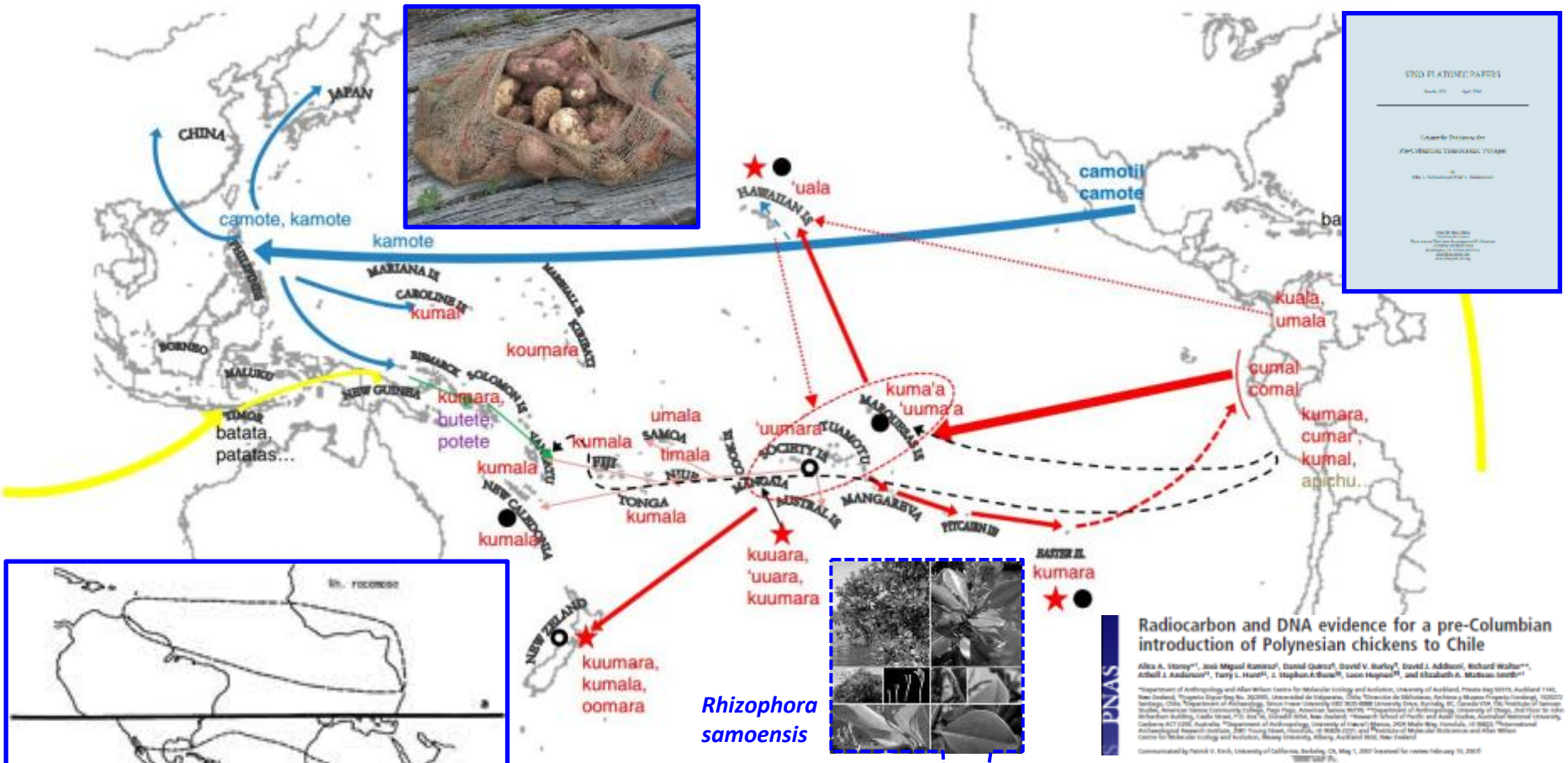
- Bakau spp *Rhizophora apiculata*, *R. mucronata* & *R. stylosa* = persebaran luas.
- Persebaran spp tsb cocok dgn pola pergerakan pelayaran bangsa Austronesia.
- Bangsa Austronesia berani berlayar di perairan laut karena yakin adanya bakau.
- Bangsa Austronesia = Bangsa Bakau, terutama *Rhizophora*.
- Bangsa Austronesia = Bangsa *Rhizophora*.
- Bakau identik dgn Bangsa Austronesia.
- Jadi... *Mangrove is Austronesia*.





- Bangsa **Austronesia** diyakini mengetahui & memahami arus2 laut katulistiwa & menggunakan dalam pelayarannya ke **Pasifik** & benua **Amerika**.
- Bukti bangsa Austronesia sampai ke benua Amerika jauh sebelum Kolombus = Persebaran jenis2 tumbuhan dari benua Amerika ke Pasifik & Nusantara sebelum Kolombus (*pre Columbian plant dispersals*), misalnya = **ubi manis** (*Ipomoea batatas*).





*Rhizophora samoensis*

### Radiocarbon and DNA evidence for a pre-Columbian introduction of Polynesian chickens to Chile

Alice A. Storey<sup>1\*</sup>, José Miguel Ramirez<sup>2</sup>, Daniel Quere<sup>3</sup>, David V. Burley<sup>4</sup>, David J. Adelson<sup>5</sup>, Richard Walter<sup>6\*</sup>, Arthur J. Anderson<sup>7</sup>, Terry L. Hunt<sup>8</sup>, J. Stephen A. Burn<sup>9</sup>, Leon Hyslop<sup>10</sup>, and Elizabeth A. Matisoff<sup>11\*</sup>

<sup>1</sup>Department of Anthropology and African Studies Centre for Molecular Ecology and Evolution, University of Auckland, Private Bag 1142, Auckland 1142, New Zealand; <sup>2</sup>Departamento de Biología, Universidad de Valparaíso, Valparaíso, Chile; <sup>3</sup>Departamento de Biología, Universidad de Valparaíso, Valparaíso, Chile; <sup>4</sup>Department of Anthropology, Simon Fraser University, 225 RMCB University Drive, Burnaby, BC, Canada V5A 1S6; <sup>5</sup>Department of Anthropology, University of California, Berkeley, CA, USA; <sup>6</sup>Department of Anthropology, University of California, Berkeley, CA, USA; <sup>7</sup>Department of Anthropology, University of California, Berkeley, CA, USA; <sup>8</sup>Department of Anthropology, University of California, Berkeley, CA, USA; <sup>9</sup>Department of Anthropology, University of California, Berkeley, CA, USA; <sup>10</sup>Department of Anthropology, University of California, Berkeley, CA, USA; <sup>11</sup>Department of Anthropology, University of California, Berkeley, CA, USA

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- *Rhizophora samoensis* syn. *R. mangle*.
- Gerbang terluar Pasifik yg menghubungkan dgn benua Amerika.
- Digunakan bangsa Austronesia sbg jembatan menyeberang ke Amerika
- Bukti2 = Ubi jalar, ayam.

# KEDATUAN SRIWIJAYA = KEDATUAN BAKAU PERTAMA



Kedatuan **Sriwijaya** wilayahnya hampir mirip dgn persebaran *Rhizophora apiculata*.

Prepared by H. Otley Beyer from the original sources

## THE EMPIRE OF SRI-VISHAYA TOWARD THE END OF THE TWELFTH CENTURY

# KEDATUAN MAJAPAHIT = KEDATUAN BAKAU KEDUA



- Kedatuan Majapahit wilayahnya hampir mirip dgn persebaran *Rhizophora stylosa*.
- Meski ada laporan bahwa Majapahit mengetahui keberadaan Madagascar = *Rhizophora mucronata*.



# KEDATUAN MAJAPAHIT = KEDATUAN BAKAU KEDUA



Marchinbar Island  
(Discovery of 1000 year old  
Kilwa coins)



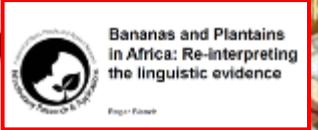
*Rhizophora stylosa*

## BHUMI PUGER (AUSTRALIA)



- Kedatuan Majapahit wilayahnya hampir mirip dgn persebaran *Rhizophora stylosa*, termasuk sampai bagian utara benus Australia.
- Teripang merupakan komoditi laut penting Majapahit yg dijual terutama ke Tiongkok.
- Nelayan2 Majapahit mencari & berniaga teripang hingga ke pantai utara Australia (= **Bhumi Puger**) = Didukung oleh temuan koin2 & meriam cetbang Majapahit.
- Pelaut2 Majapahit menyusuri pantai2 dgn yakin karena ada **BAKAU**.

# PERGERAKAN BANGSA AUSTRONESIA: PERGERAKAN BANGSA BAKAU



Jalur yg dipakai Austronesia ke Mesir Kuno & Babilonia membawa rempah2, kelapa, kapur barus, kayumanis, pisang & beras, serta ayam



Austronesian! Bawa padi huma, kelapa, pisang, ayam & bambu (untuk suling)

Daerah asal usul Austronesia dari Paparan Sunda/Sundaland (25.000 SM)! BUKAN dari Bascon-Hoabinh, Cina, India Belakang atau Taiwan!



Jalur yg dipakai Austronesia ke India membawa rempah2, kapur barus, kelapa, pisang, kayumanis & beras serta ayam



Kawasan di mana Austronesia & Melanesia bertemu



Pergerakan Austronesia ke Pasifik



Jalur yg dipakai Austronesia ke Cina membawa rempah2, kapur barus, kelapa, pisang, kayumanis & beras serta ayam



Pergerakan Austronesia ke Pasifik

Pergerakan Austronesia ke Paparan Sahul

Pergerakan Austronesia ke Paparan Sahul, bawa anjing yg jadi leluhur dingo



Pergerakan Austronesia ikuti sirkum Pasifik ke Jepang & Amerika

Pergerakan Austronesia ikuti sirkum Pasifik ke Jepang, orang Ainu & Nagasaki punya gen & kata-kata yg sama dgn Austronesia

Pergerakan Austronesia ke Paparan Sahul

Pergerakan Austronesia ke Paparan Sahul

Pergerakan Austronesia via Pasifik ke Amerika



Austronesia! Suku Indian asli di sini menggunakan perahu bercadik yg diduga asalnya dari kunjungan orang Austronesia dari Pasifik

Diduga dari Austronesia karena penggunaan perahu bercadik oleh penduduk asli

DNA mitokondria Austronesia ditemukan di Amazon!

Austronesia! Tulang ayam kampung asal Nusantara ditemukan di Chile sebelum Inca!

Radiocarbon and DNA evidence for a pre-Columbian introduction of Polynesian chickens to Chile



Linguistic Evidence for a Prehistoric Polynesian-Southern Californian Contact Event

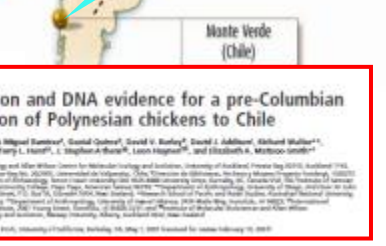
Identification of Polynesian mtDNA haplogroups in remains of Ancestral Amerindians from Brazil

Tracking Austronesian expansion into the Pacific via the paper mulberry plant

Genetic dating indicates that the Austronesian expansion through Eastern Indonesia corresponds to the Austronesian expansion

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- Tulisan ilmiah oleh bangsa Eropa pertama ttng rempah Nusantara oleh **G.E. Rumphius** di *Herbarium Amboinense* terbitan **1743**.
- Rumphius mencatat **5 spp** bakau di Maluku.
- Rumphius identifikasi ke satu marga saja, **Mangium**.
- Bahasa daerah Ambon utk bakau = **Mangi mangi**.
- *Mangium candelarium* = **Rhizophora apiculata**.
- *Mangium caryophylloides* = **Ceriops tagal**.
- *Mangium celsum* = **Bruguiera gymnorhiza**.
- *Mangium minus* = **Bruguiera cylindrica**.
- *Mangium digitatum* = **Bruguiera sexangula**.
- Rumphius menulis pentingnya bakau utk bahan bangunan, makanan, obat & pewarna.
- Rumphius jg menulis pentingnya bakau bagi masyarakat Ambon = sebagai tempat berlindung **anak2 ikan** & tempat hidup **kepiting**.
- Dilindungi Hukum Adat = Sasi = **Sasi Mangi Mangi**.
- Diangkat sbg Hukum Adat (Adat Wet) & berlaku utk semua warga.



# HERBARIUM AMBOINENSE DI ERA MILENIAL

GEORGHII EVERHARDI RUMPHII,  
*Med. Doct. Historiæ, Medicinæ Sæcularis, & in Ambonâ Capite, vniuersitatis  
 PLINII INDICI telusis, & Membri Indagis Scientiæ Academiæ Naturæ Curiosiorum Germaniæ,*  
**HERBARIUM  
 AMBOINENSE,**

Floribus compluctis Arboreis, Fructibus, Herbas, Plantis terrestribus & aquaticis,  
**QUAE IN AMBOINA,**  
 ET ADJACENTIBUS REPERIUNTUR INSULIS,  
 Alacritate delineatas iuxta curam formam, cum diversis denominationibus,  
 cultura, usu, ac virtutibus,

*Quod & insuper exhibet*  
**VARIA INSECTORUM ANIMALIUMQUE GENERA,**  
 Plurima cum notandis raris figuris depictis.  
 Omnia magno labore ac studio multos per annos collecta,  
 & duodecim conscripta libris:

Nunc primum in lucem edita, & in Latinum feruorem versa,  
 Cura & Studio

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Qui vixit aduæ Sprouyna, fuitque Observatoris

**P A R T I E R T I A**



AMSTELÆDAMI, Apud FRANCISCUM CRABBIUM, JOANNEM CAYETI,  
 HÆRANUM UYVERSIJN

HÆC COMITIA, Apud PETERUM GOSSII, JOANNES NEAUME, ANGLÆ  
 MORTUARI, ANTONIUS VAN DUAL.

ULTRAJECTI, Apud STEPHANUM NEAUME.

M. DCC. XLIII **1743**



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Journal of Ethnopharmacology 96 (2005) 57–70

Journal of  
**ETHNO-  
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## Bioprospecting Rumphius's *Ambonese Herbal*: Volume I

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Received 10 December 2003; received in revised form 6 July 2004; accepted 18 August 2004

Available online 12 October 2004

### Abstract

Collaborating with traditional healers remains a valid method for the identification of potential lead compounds for novel pharmaceuticals. However, the knowledge of these traditional healers is rapidly being lost. Historic herbal texts provide a unique window to identify plants whose specific uses are no longer known. We have identified nine plants in the 17th century *Ambonese Herbal*: Volume I which were documented as having medicinal properties but which have not been examined in the current literature. We demonstrate that by evaluating plant and herb efficacy reports from historic texts, in the context of comprehensive modern databases such as NAPRALERT<sup>TM</sup>, we can ultimately identify candidate specimens deserving further pharmacological study.

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**Keywords:** Historic text; Ambon; Rumphius; Indonesia; Ethnobotany; Medicinal; Plants

Table 2

List of all plants contained in *The Ambonese Herbal*: Volume I, Rumphius reported medicinal use, and NAPRALERT<sup>TM</sup> ethnomedical, biochemical, and isolated compound information

Rumphius name [current name]	Rumphius medical	NAPRALERT <sup>TM</sup>		
		Ethnomedical	Biochemical	Isolated compound
Anacardiaceae				
<i>Anacardium occidentale</i> L.	•	•	•	•
<i>Dracontomelon mangiferum</i> Blume				
<i>Dracontomelon sylvestris</i> Blume	•			
<i>Mangifera foetida</i> Lour.		•	•	
<i>Mangifera indica</i> L.	•	•	•	•
<i>Mangifera rumphii</i> Pierre				
<i>Mangifera utana</i> Buch.-Ham.				
<i>Semecarpus cassuvium</i> Roxb.	•			
<i>Spondias dulcis</i> Parkinson	•	•	•	•
<i>Spondias pinnata</i> (L. f.) Kurz		•	•	•

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 BIORESOURCES**, so  
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 suppose to be  
 done by  
**INDONESIANS!**  
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# KESIMPULAN

- Bakau memiliki pusat keragaman jenis di kawasan tropika Nusantara & mempengaruhi peradaban bangsa yg tinggal bersamanya = **Austronesia**.
- Bangsa **Nusantara (Austronesia & Melanesia)** memanfaatkan bakau utk berbagai keperluan dari makanan, bangunan, pembuatan kapal, pewarna hingga obat.
- Bangsa Austronesia sudah mengenal bakau sejak masih di Paparan Sunda (**Sundaland**) **25.000 – 10.000 SM**.
- Pelayaran besar bangsa Austronesia mengikuti **persebaran bakau**, khususnya ***Rhizophora* spp.**, terutama ***R. apiculata*, *R. mucronata* & *R. stylosa***.
- Terutama utk keamanan dari badai, ketersediaan logistik & air tawar.
- Sedemikian hingga **Bangsa Austronesia** disebut pula **Bangsa Bakau**, khususnya **Bangsa *Rhizophora***.
- Peradaban besar Nusantara spt Kedatuan2 **Sriwijaya & Majapahit** dibangun atas poros maritim berdasarkan pelayaran samudera = mengikuti bakau = **PERADABAN BAKAU**.
- Bakau sangat penting utk eksistensi bangsa Austronesia itu sendiri = **Bakau adalah kita!**
- Kajian ilmiah **Etnobiologi Bakau Indonesia** perlu dikembangkan karena **Indonesia** adalah pusatnya peradaban **Austronesia & Melanesia**.

*Avicennia alba* (Acanthaceae), Pulau Enggano



**TERIMAKASIH**

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*Sonneratia alba* (Lythraceae), Pulau Simeulue