



Missouri Botanical Garden
-
Plants for a sustainable future

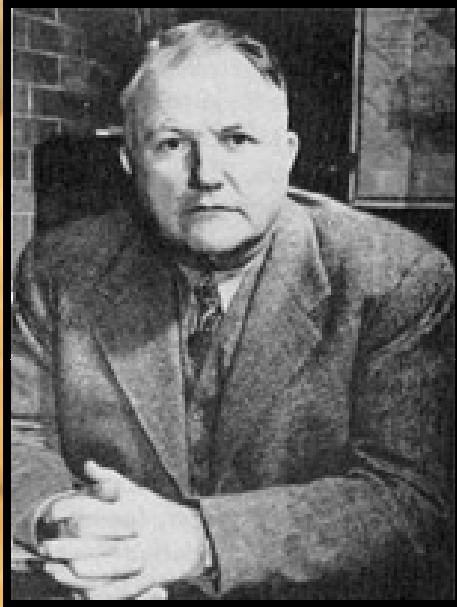
Rainer W. Bussmann

**William L. Brown Center
Missouri Botanical Garden**

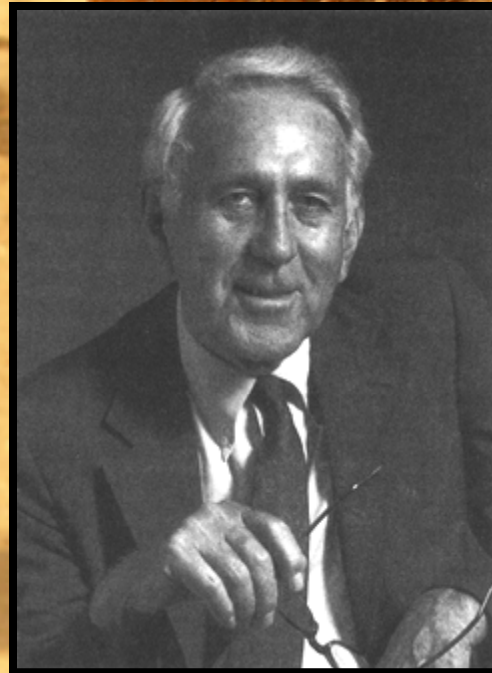


a division of the  MISSOURI BOTANICAL GARDEN

Becoming the William L. Brown Center

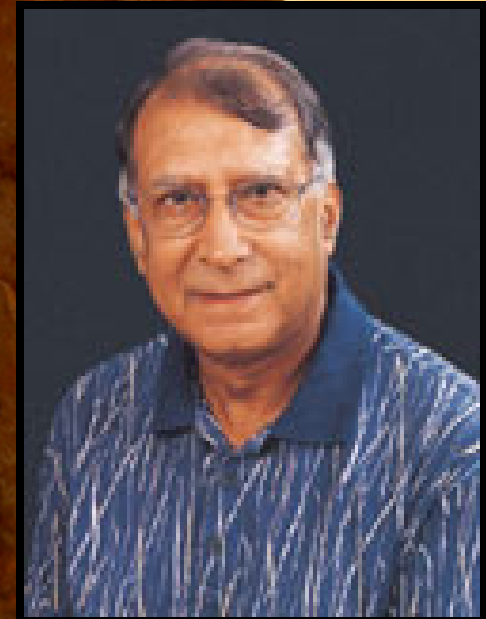


Dr. Edgar Anderson



Pioneer Hi-Breed Intl., Inc.

Dr. William L. Brown



Dr. Suri Sehgal

Countries of main emphasis





Research Areas:

- **Ethnobotany / Palaeoethnobotany**
- **Natural products, under-used plant resources and markets**
- **Seed and germination ecology**
- **Plant ecology and regeneration ecology**
- **Intellectual property rights**
- **Natural resource management**

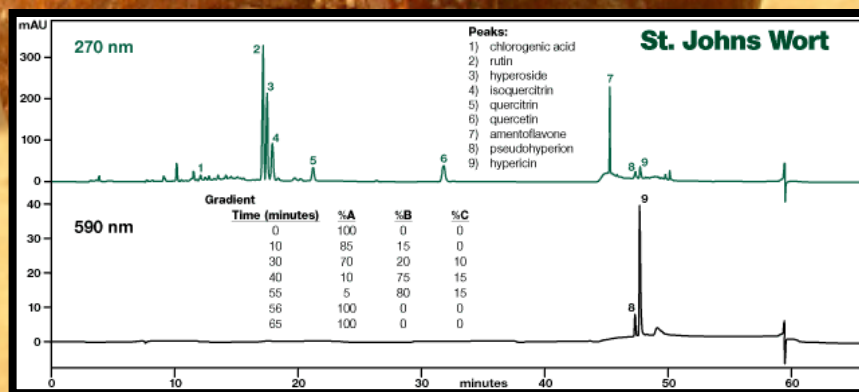
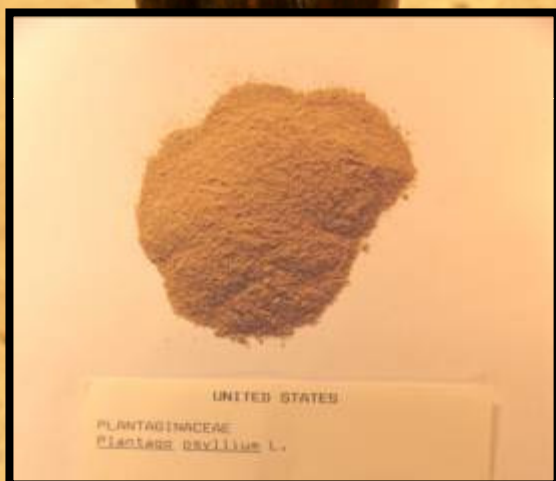
Objectives:

- Documentation of traditional knowledge
- Harvest / production and market flows
- Development of crops and products
- Supply of “safe” and “standardized” natural products



Verification of material in commerce





Identification of Botanicals



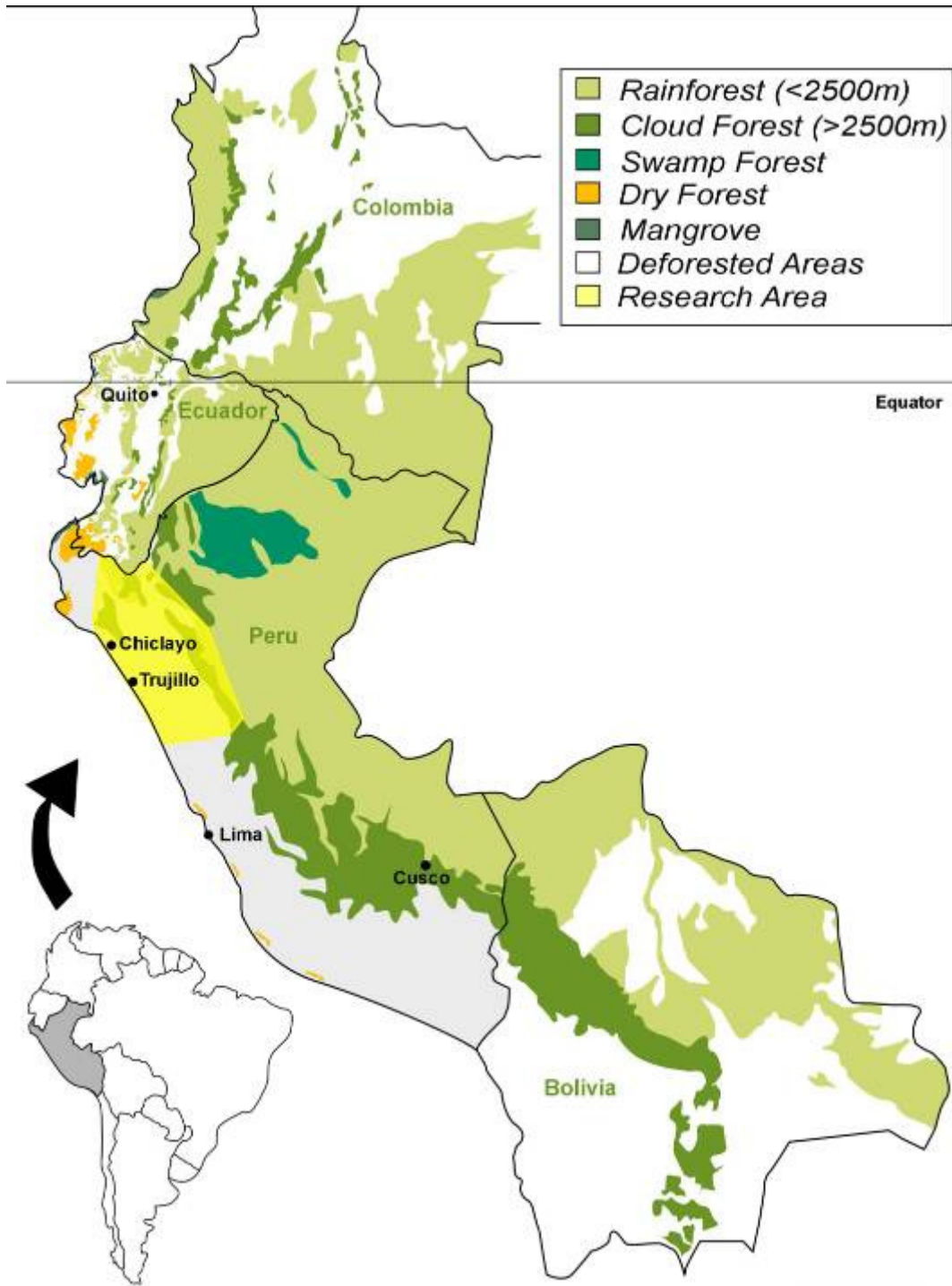
Natural Products Research

(National Center for Natural Products Research,
National Cancer Institute,
International Cooperative Biodiversity Group, etc.)



The International Center for Indigenous Phytotherapy Studies (TICIPS)

University of Missouri – Columbia, University of the Western Cape,
Missouri Botanical Garden, University of KwaZulu-Natal

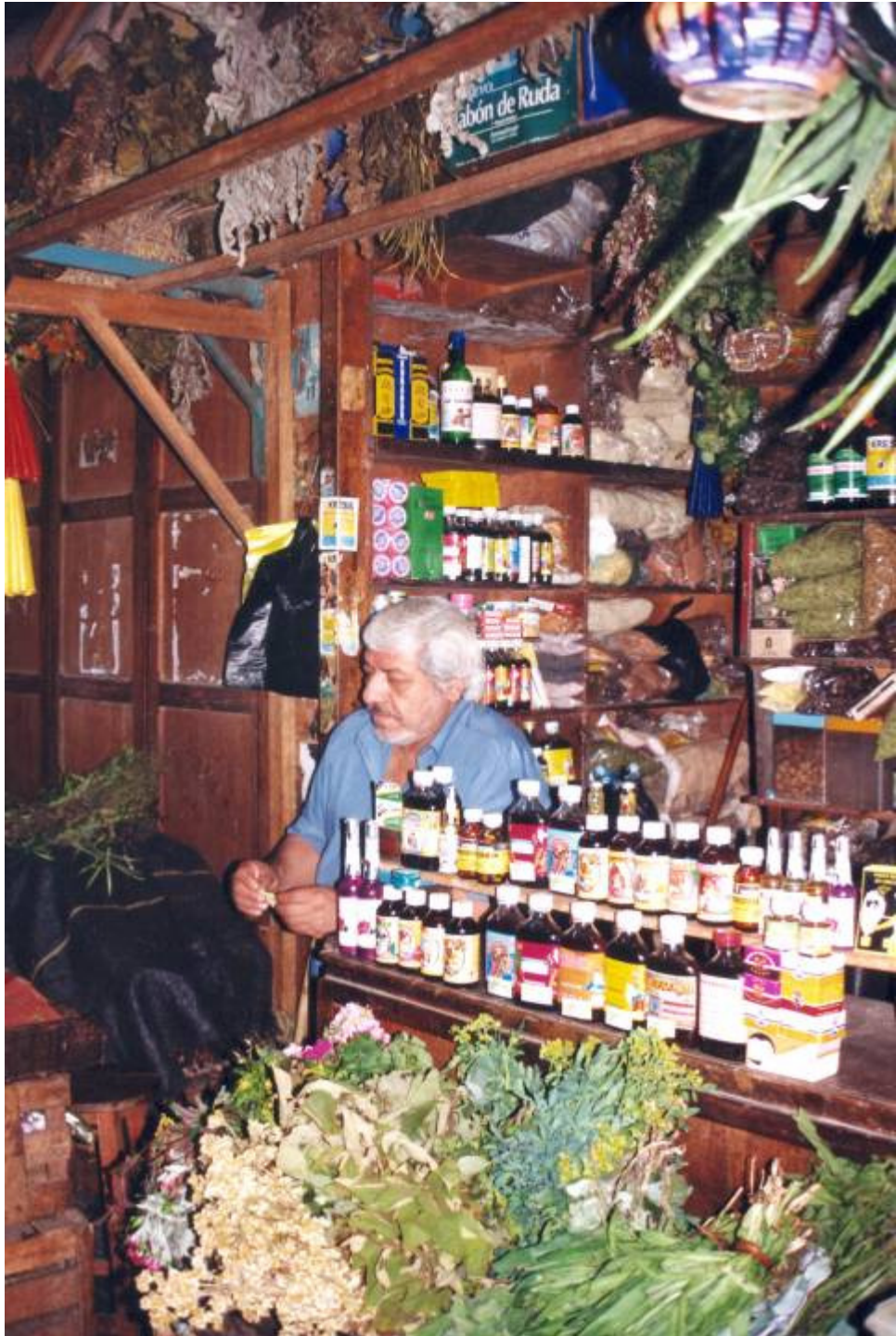




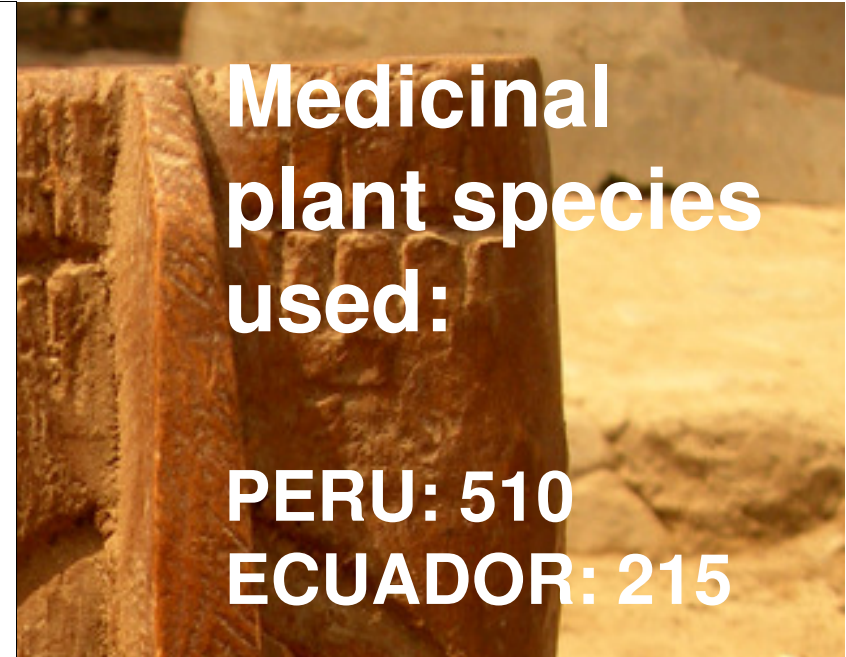
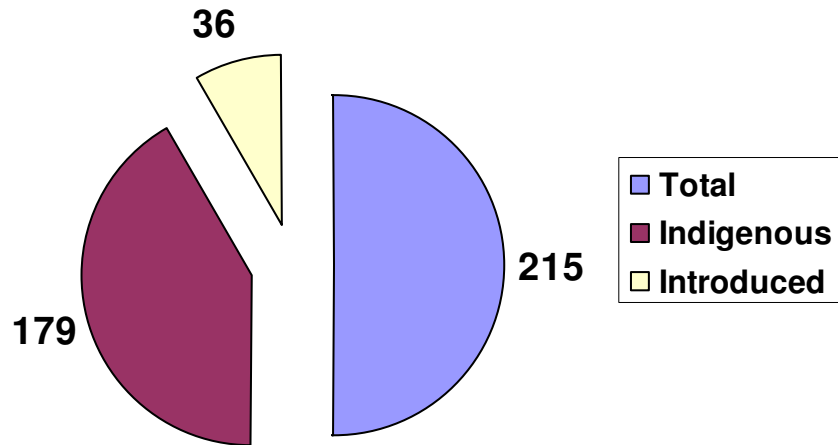




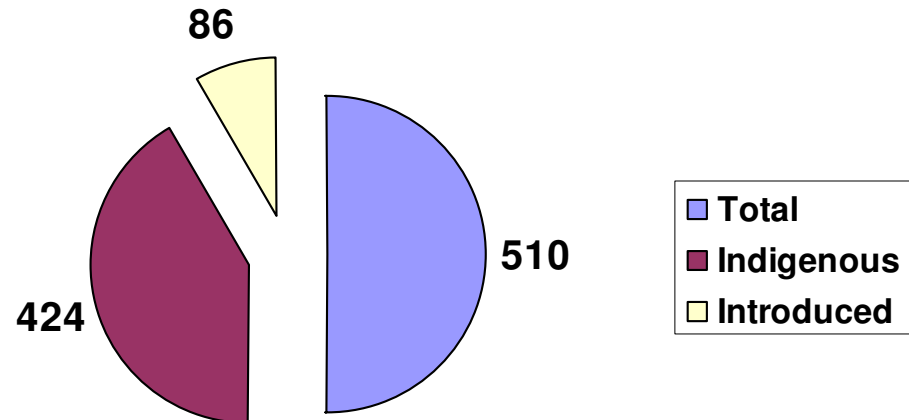




Number of species ECUADOR



Number of species PERU

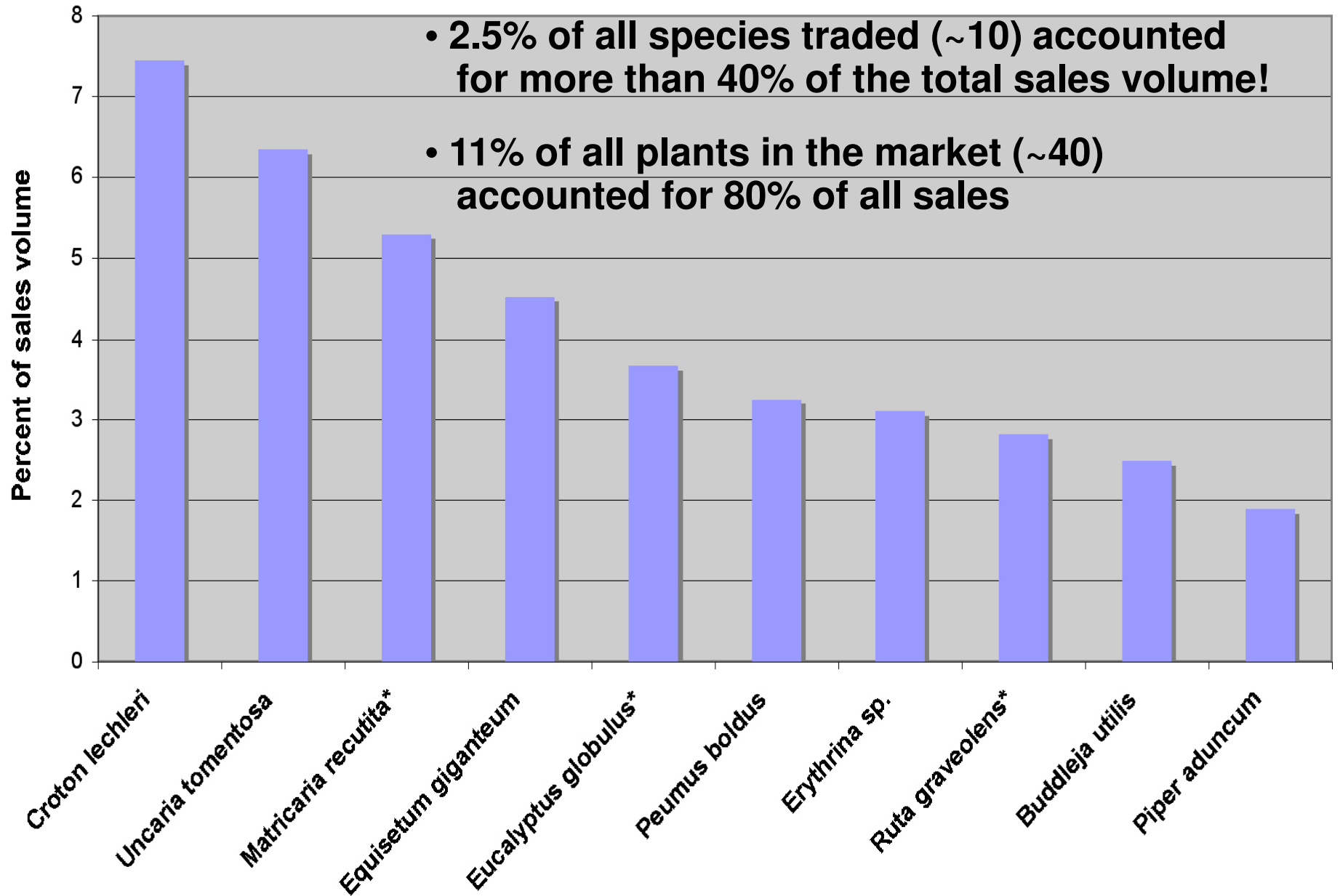


Introductions:

17% in both countries



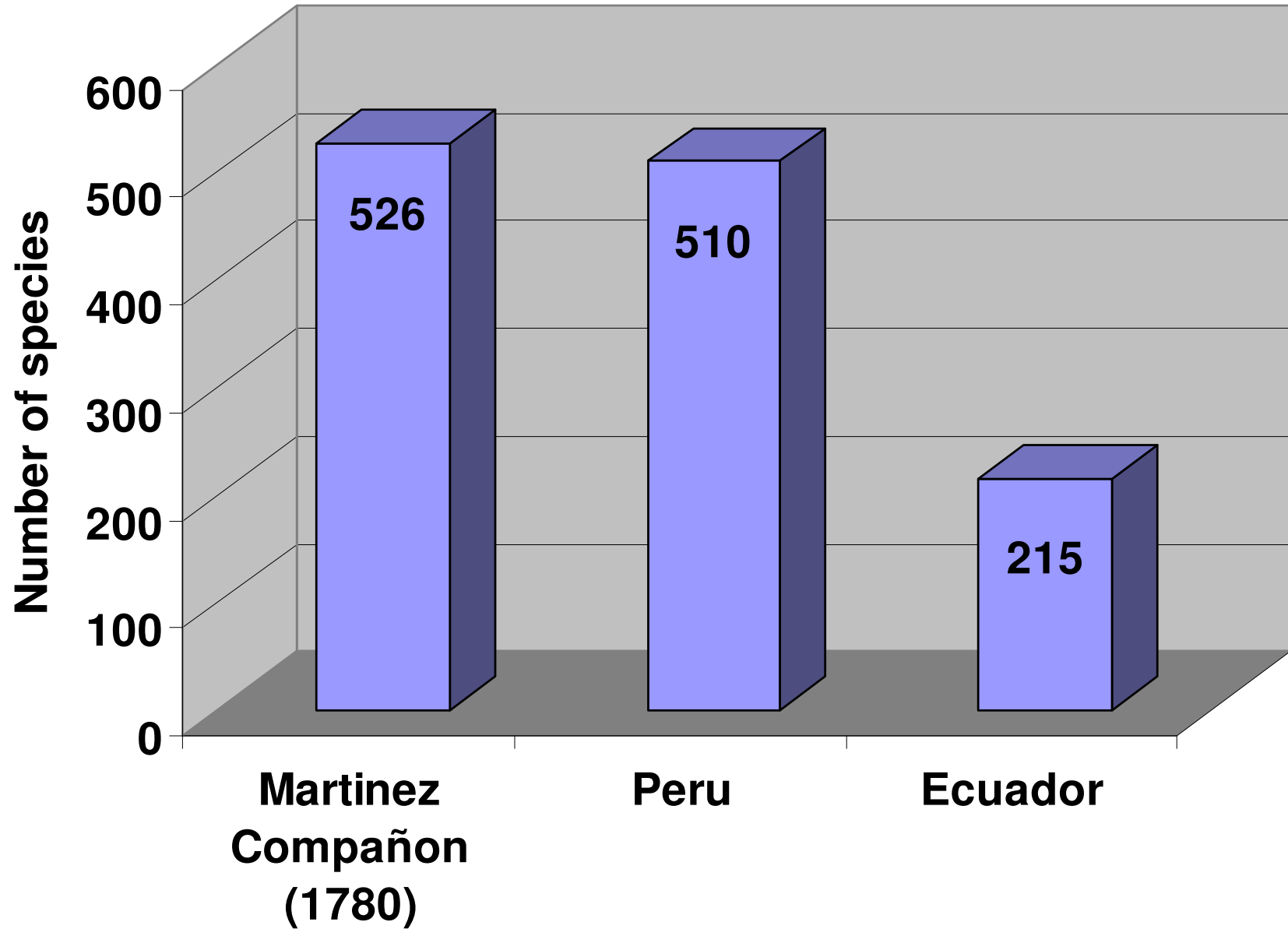
Most important species by sales volume



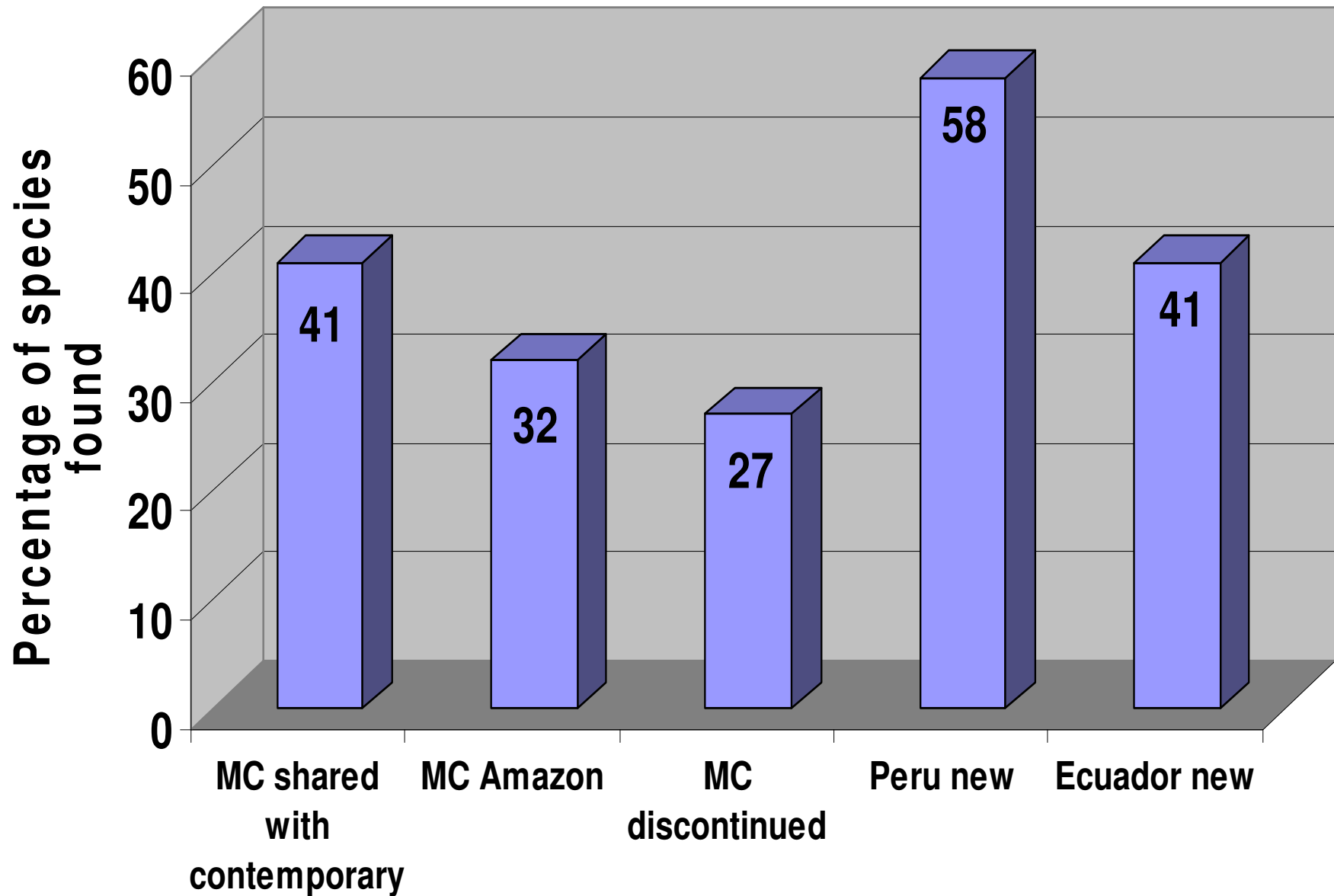
Pseudogynoxis cordifolia (Cass.) Cabr.



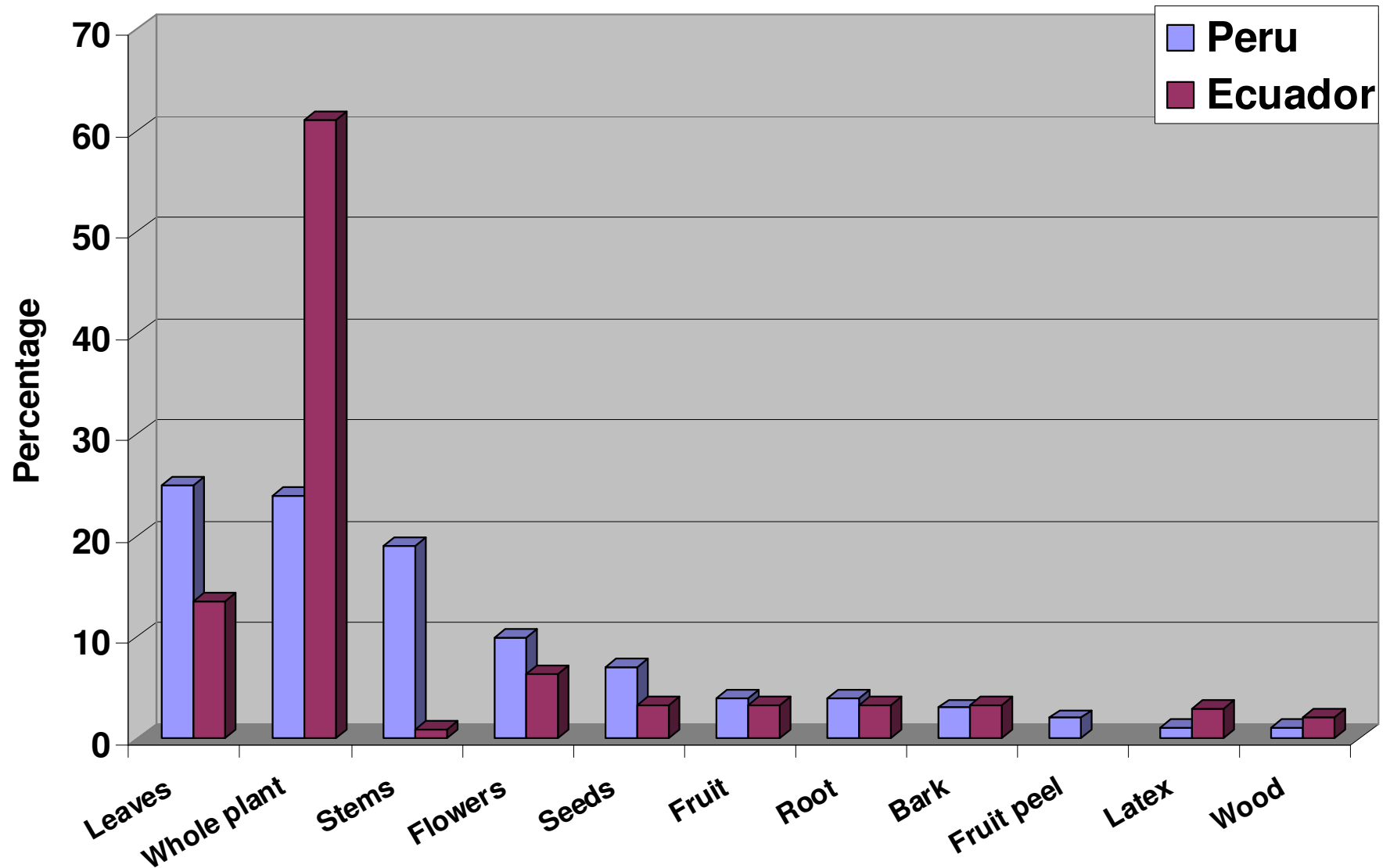
Number of plant species used



Comparison of species assemblies



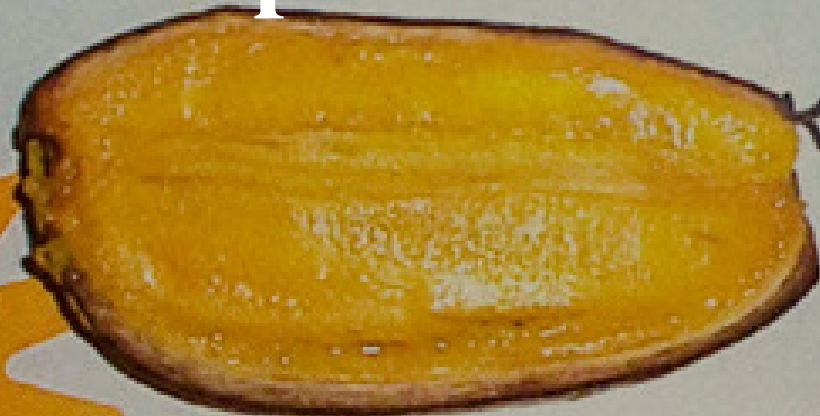
Parts of medicinal plants used in Peru and Ecuador



Bananas in Pohnpei:



Utim wahs -14



Karat Pwehu -10

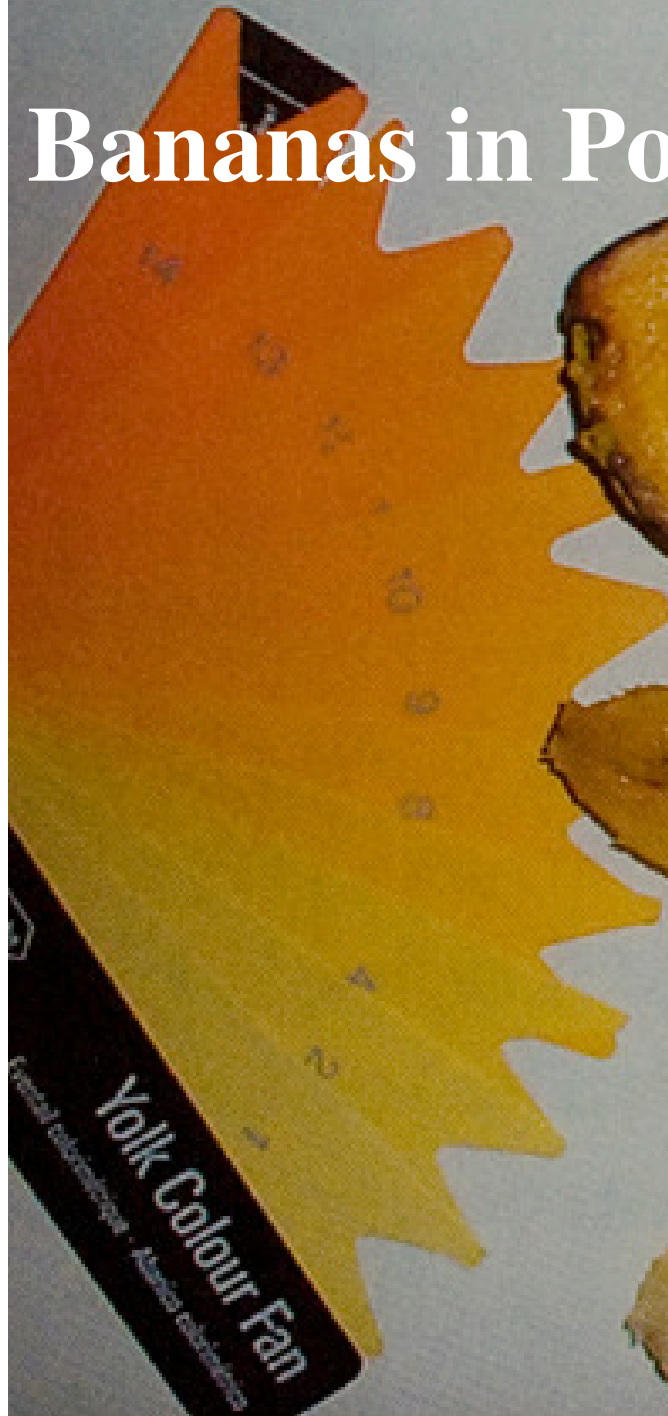
Mangat -9



Taiwang -6

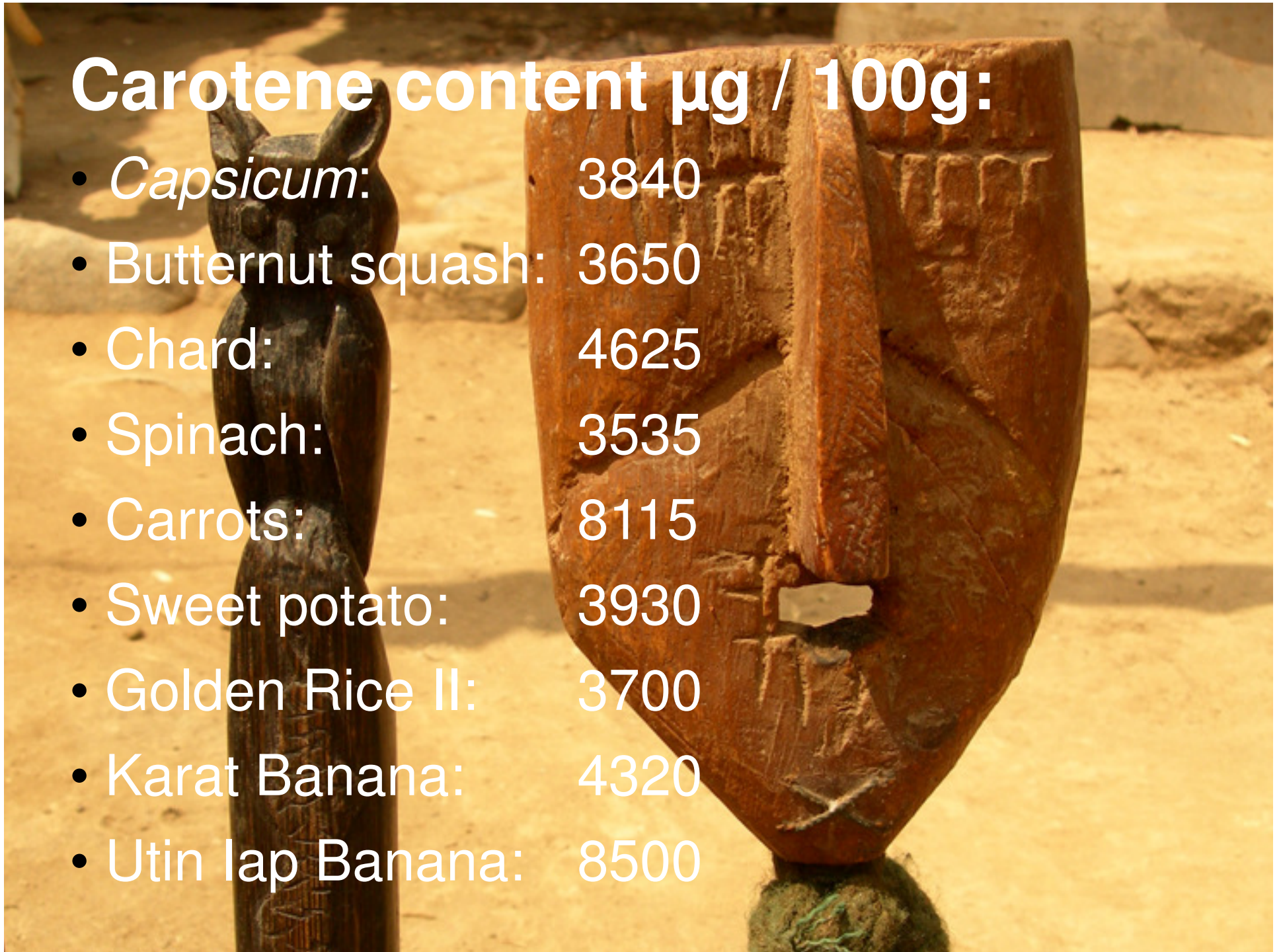


Utin Menihle -1



Carotene content μg / 100g:

- *Capsicum*: 3840
- Butternut squash: 3650
- Chard: 4625
- Spinach: 3535
- Carrots: 8115
- Sweet potato: 3930
- Golden Rice II: 3700
- Karat Banana: 4320
- Utin lap Banana: 8500

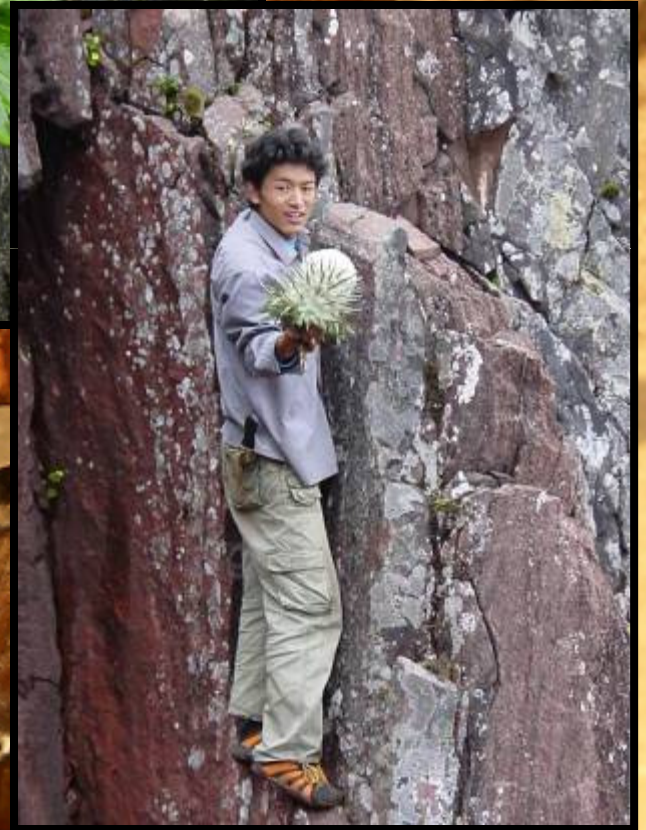




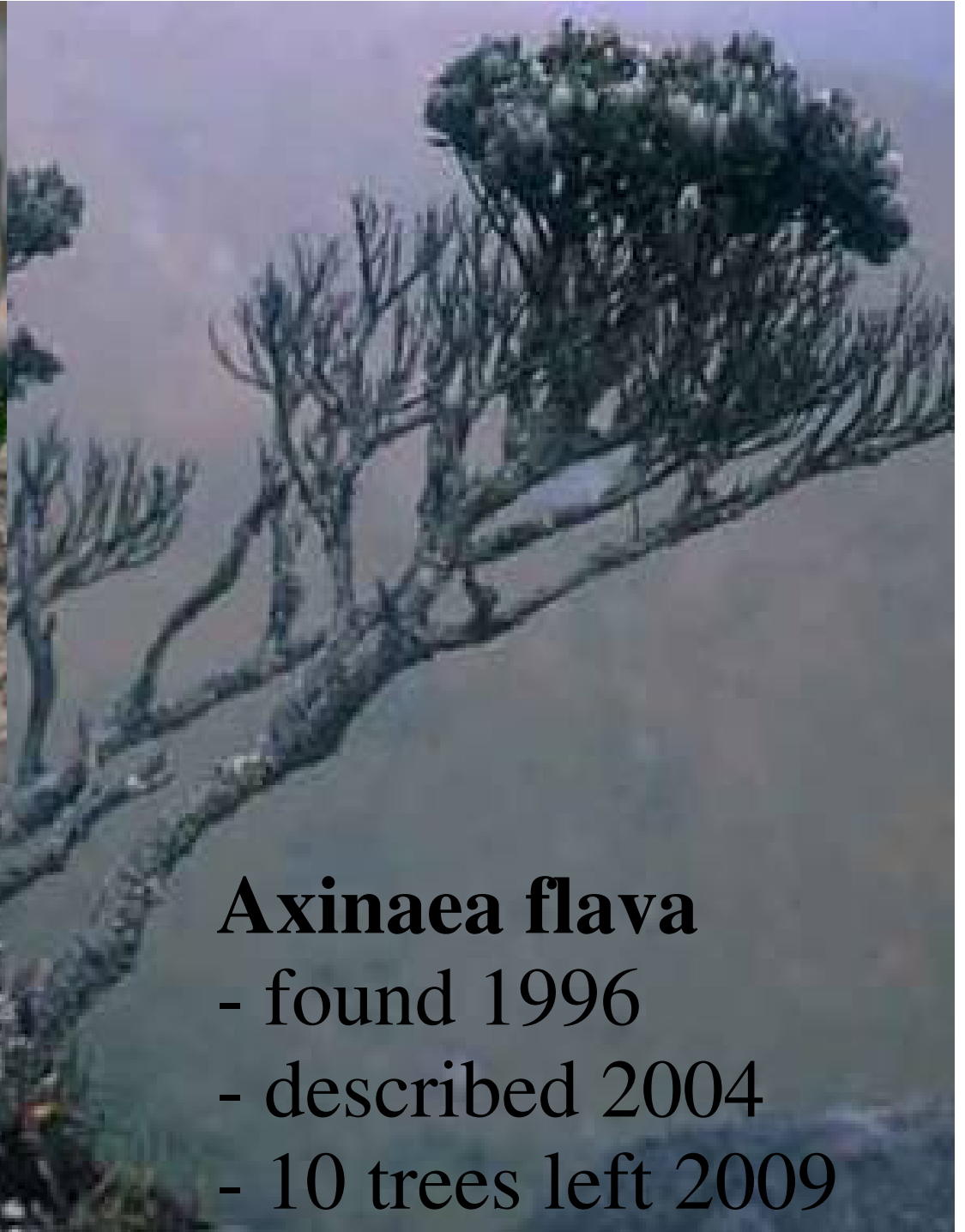


Markets and Threats:

- \$ 2 million market in Region
- Collector income only 2.80-6.10\$/day
- \$ 80 billion world market in medicinals
- Most species available online!
- Almost no cultivation of important species
- Over-harvesting due to rising demand
- Large scale bio-fuel production and mining
- High altitude systems altered by climate change



**Over-harvest of
Tibetan
snow lotus**



Axinaea flava

- found 1996
- described 2004
- 10 trees left 2009



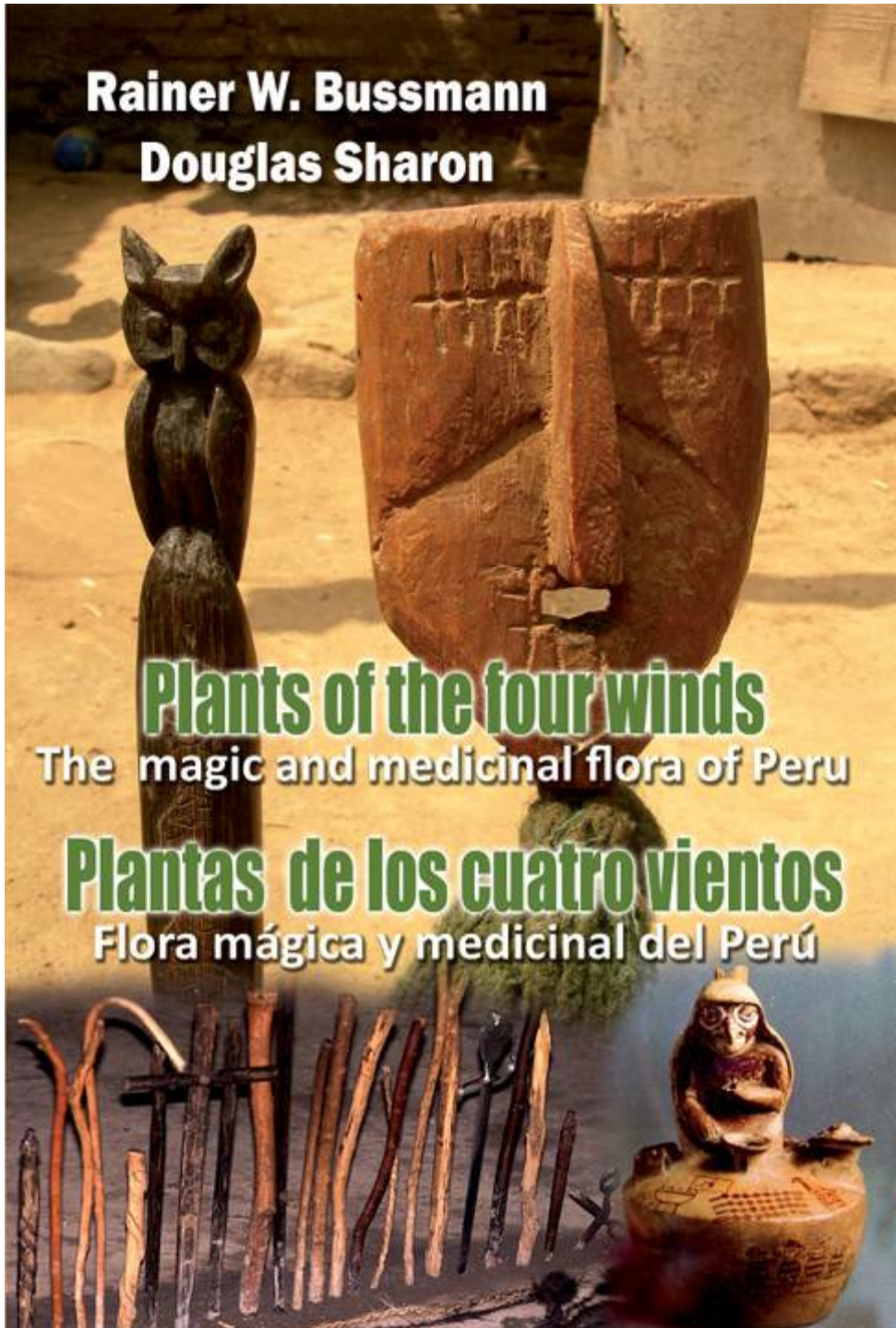
**Rainer W. Bussmann
Douglas Sharon**

Plants of the four winds

The magic and medicinal flora of Peru

Plantas de los cuatro vientos

Flora mágica y medicinal del Perú

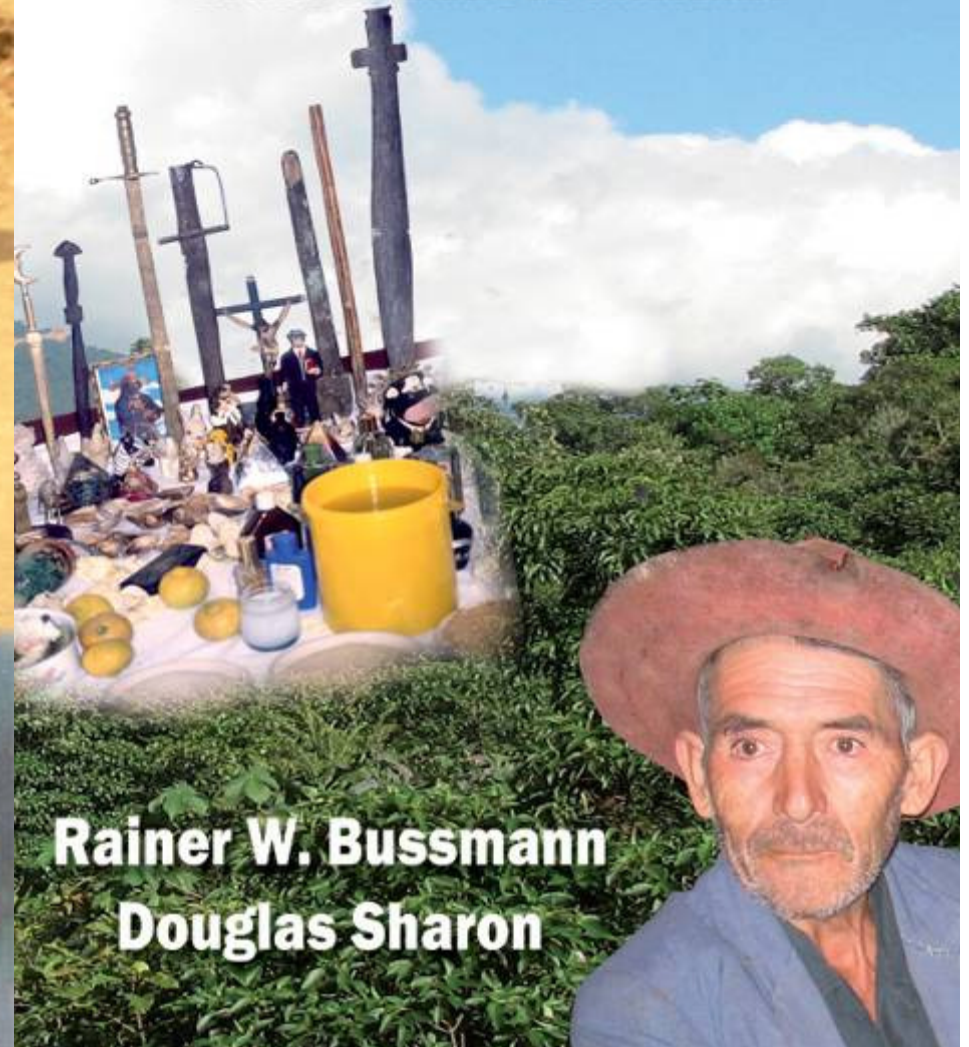


Plants of longevity

The medicinal flora of Vilcabamba

Plantas de longevidad

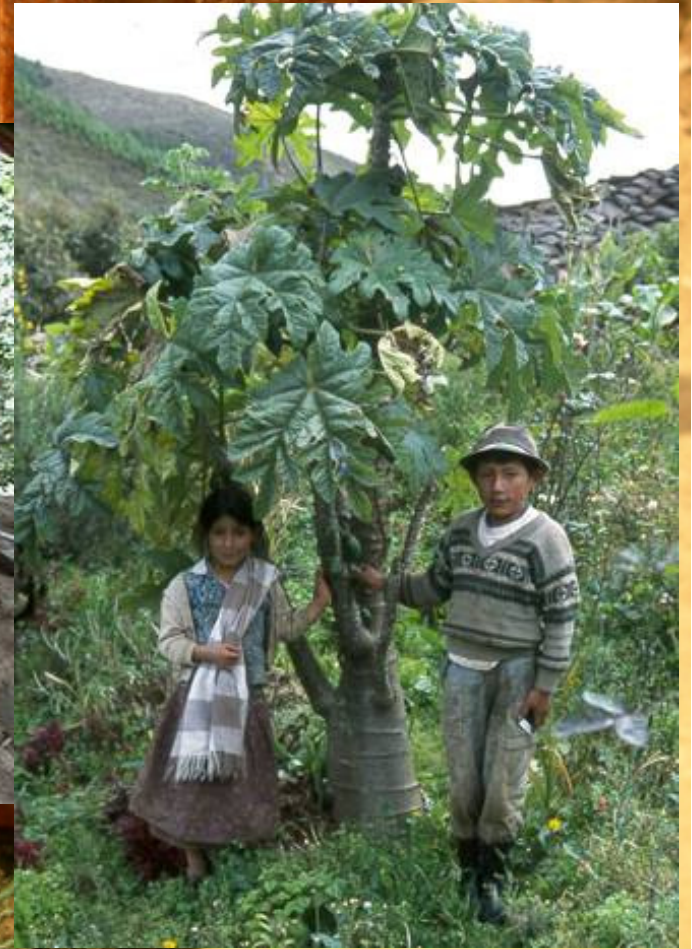
La flora curandera de Vilcabamba



**Rainer W. Bussmann
Douglas Sharon**

“Sacred Seeds”

Healing the planet one garden at a time



Sacred Seeds Peru



Sacred Seeds Madagascar



In Praise of . . .

Plants of Semillas Sagradas:

An Ethnomedicinal Garden in Costa Rica

"Medicinal plants, often considered sacred for their healing powers, are more than ever threatened by over-harvesting, ecosystem destruction and climate change. *Semillas Sagradas* represents the first holistic attempt, blending traditional knowledge with modern science, to preserve important species and the associated lore for future generations. The book will be of great value to healers, botanists and teachers, and will help to pass ancestral knowledge to future generations. The authors are to be congratulated for their achievement, and that the concept of *Semillas Sagradas* will spread to all corners of the globe."

—Rainer W. Bussmann, Ph.D., William L. Brown
Curator of Economic Botany, Herbar. Wm. L. Brown
Center for Plant Genetic Resources,
Missouri Botanical Garden

"Costa Rica is a nation rich in plant diversity, and this book provides a fascinating review of the traditional uses and modern research on a selection of species employed as herbal medicines in the region. Written by two experts in the field of ethnomedicine, this book is a comprehensive introduction to some of the plants growing in Finca Luna Nueva's Sacred Seeds Sanctuary, a facility that serves as a model for the conservation of vital medicinal plants and ethnobotanical lore in other areas of the world."

—Mark Blumenthal, Founder and Executive Director
American Botanical Council (ABC)

"Having personally observed the diligent field and bibliographic research of this talented team, I applaud both this book and the concepts behind it, conservational, cultural, educational, ethnomedicinal, and spiritual. Rafael, Michael, Ruth and Katherine have done Costa Rica and the world a favor in bringing this great garden and beautiful book to fruition."

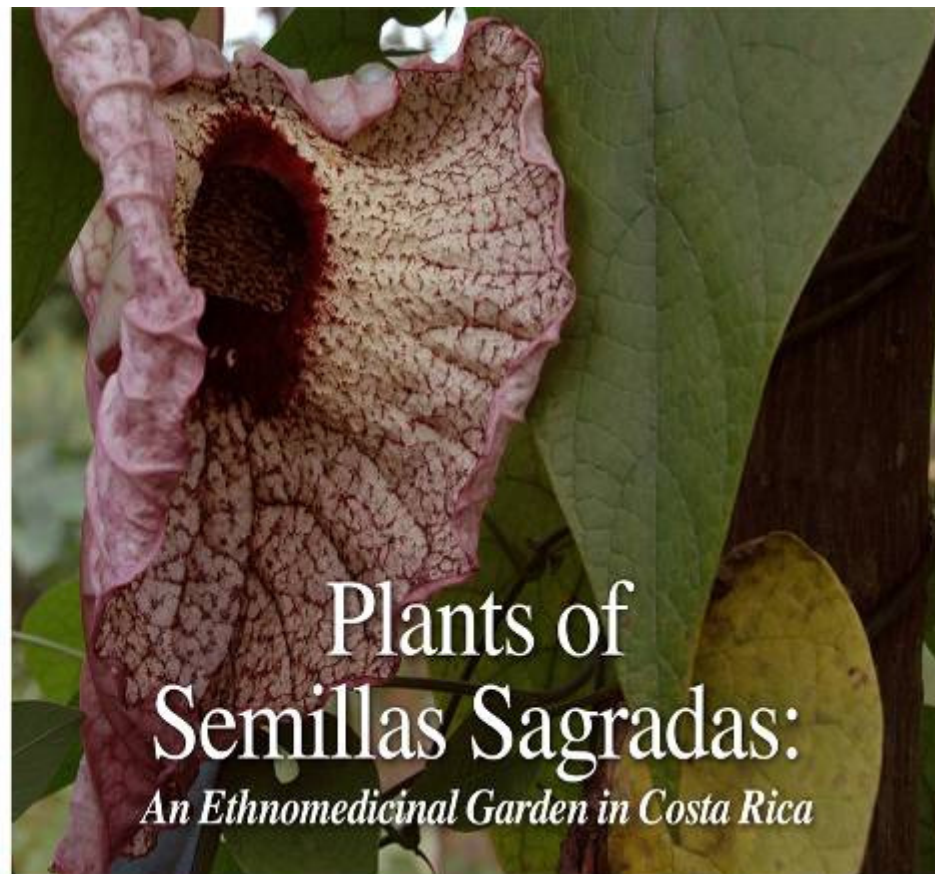
—James A. Duke, Ph.D., Author of *The Green Pharmacy Guide to Healing Foods*
(Noida, 2008)



9 780615 274157

Plants of Semillas Sagradas: An Ethnomedicinal Garden in Costa Rica

ISBN: 978-0-615-27415-7



Plants of Semillas Sagradas:

An Ethnomedicinal Garden in Costa Rica



Rafael Ocampo, BSc. and Michael J. Balick, Ph.D.

Foreword by Peter H. Raven, Ph.D.

Edited by Ruth Goldstein and Katherine Herrera



Plukenetia huayllabambana





Herbal Products

