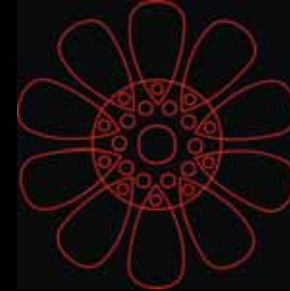


Taxonomy for Ghana's development and conservation - assessing the needs
Ghana-UK project 2006-7, Workshop 1-4 August, Accra & Aburi, Ghana
Supported by the WSSD implementation Fund of Defra (UK)



Why

taxonomy matters

2 August 2006, Assessing the taxonomic needs of
Ghana, first workshop, Aburi

Richard Smith Director, BioNET-INTERNATIONAL Secretariat

Why Taxonomy Matters

medicinal plants **fisheries** aquaculture
forestry pest management **biocontrol**
invasive alien species **pollinators**
tourism **trade** biodiversity conservation
forensics transportation **engineering**
construction **food safety** health (human
and animal) **agriculture** horticulture
forensics...

Preventing invasive species - slugs and snails slip in to Sri Lanka

case study 30

Contributed by: Fred Naggs (NHM, UK)

case study 30

slugs and snails slip in to Sri Lanka

Problem: Exotic species were mistakenly assumed to be native to Sri Lanka, because of the lack of taxonomic collections and guides. The exotic species **threaten the rich and highly endemic land snail fauna, as well as agriculture and horticulture.**

case study 30

slugs and snails slip in to Sri Lanka

Methods Reference collections and a distribution database were established in Sri Lanka, using the NHM resources and a national survey.

Outcomes Populations of exotics were located and identification guides to the native fauna produced.

Future invasions can be detected rapidly.

Lessons Without expert knowledge on locally occurring species, invasive alien species become established unnoticed.

Promoting trade

case study 31

Contributed by: Eric H. C. McKenzie (New Zealand)

case study 31

saving New Zealand's squash market

Problem: Each year US\$600,000 of buttercup squash from New Zealand were being rejected by South Korea because of contamination by a fungus, *Verticillium tenerum*, a **controlled, listed pathogen** according to both South Korea and New Zealand.

case study 31

saving New Zealand's squash market

Methods A thorough review was made of the naming, biology, distribution, and pathogenicity of the fungus.

Outcome1 The correct name for the fungus was found to be *Verticillium luteo-album*, a non-pathogenic species.

Outcome 2 South Korea and New Zealand accepted the research and removed this non-tariff trade barrier.

Lesson Effective and fair regulation of trade depends on the latest taxonomy.

Cheaper, safer roads

case study 19

Contributed by: Eugene Marais (BioNET-SAFRINET National Coordinator, Namibia)

case study 19

significant cost savings in road maintenance

Problem: Shallow termite burrowing caused extensive structural instability in the roads of northern Namibia. **Roads were unsafe and maintenance costs high.**

case study 19

significant cost savings in road maintenance

Outcome / lessons:

- a taxonomic survey identified the problem termite species and their distributions
- **Comprehensive surveys bring unexpected benefits:** reduced road maintenance costs and improved road safety through targeted termite control.

Safe herbal medicines

case study 3

Contributed by: Christine Leon and Monique Simmonds,
Chinese Medicinal Plants Authentication Centre, Royal Botanic
Gardens Kew, UK

case study 3

safe herbal medicines

Problem In 1999, two cases of kidney failure in the UK resulted from prescriptions from practitioners of Chinese herbal medicine.

case study 3

safe herbal medicines

Methods Reference specimens allowed identification of the Chinese herb called *Aristolochia manshuriensis* (Chinese name: Guan Mu Tong) in the prescribed medicines. Chromotographic analysis identified renal toxins.

Outcomes Importation of medicines containing this species was banned by UK law in 2001.

Lessons Rigorous authentication systems are essential for medicinal plant markets and depend on taxonomic expertise.

Species identifications save millions in Africa

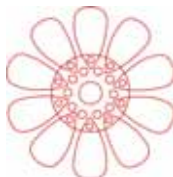
case study 10

Contributed by: Gillian W. Watson (NHM, London) & Peter Neuenschwander, Biological Center for Africa, International Institute of Tropical Agriculture)

case study 10

species identifications saves millions

Problem In 1981-1982, a new insect was found to be seriously damaging mango, citrus and other fruit trees in Ghana and Togo, and soon spread to the rest of West Africa. **The loss at this time to the mango and avocado export industries in Ghana alone was estimated as at least £130,000/year.**



case study 10

species identifications save millions

Methods Samples sent to a taxonomist and were identified as an undescribed species of mealybug from the genus *Rastrococcus* native to southern Asia (later named as *R. invadens*). Consequently the search for natural enemies was targeted on India and Malaysia.

Outcomes A undescribed hymenopteran parasitoid (since described as *Gyranusoidea tebygi* Noyes) was found in India and, after screening, was introduced to Togo in early 1987.

Effective control in Africa was achieved within 18 months of location of a parasitoid.

Savings to Benin alone have amounted to US\$ 531 mil over 20 years, with a cost / benefit ratio of 1:145.

Lessons Biological control can be established rapidly if authoritative taxonomic input is available.

Clean water & healthy fish

case study 11

Contributed by: Henrik Oksfeldt Enevoldsen (International Oceanographic Commission)

case study 11

clean water and healthy fish – protection from harmful algal blooms (HAB)

Problem Coastal states across the world experience HAB with growing frequency and intensity, damaging seafood resources, the marine environment, and human health...with negative impacts on tourism.

The monitoring of harmful micro-algae requires sound taxonomic skills, research and new identification tools.

Many institutions have, over the last 20 years, lost their taxonomic expertise in micro-algae.

case study 11

clean water and healthy fish – protection from harmful algal blooms (HAB)

Methods Regulation encouraged most countries to recognise the importance of taxonomic skills for monitoring and to request capacity development.

Outcome Funding increased, including for basic research in phylogeny, ecology, etc. of micro-algae.

Lessons Taxonomic capacity can be enhanced when pursued in a socio-economic context.

Lessons from the case studies...

- ❑ Are a resource to use for specific examples when preparing proposals and presenting the case for taxonomy.
- ❑ Provide general examples of how taxonomy contributes to sustainable development.
- ❑ Show that expertise needs to be mobilised and shared.
- ❑ Challenge the sceptics: **is taxonomy difficult to justify when the benefits far outweigh the costs at ratios such as 145:1?**

Contributing to the GTI

- ❑ **Commitment to the GTI** made at a BioNET-CBD-UNESCO meeting (Third Global Taxonomy Workshop, 2002)
- ❑ Short case studies that provide varied examples of **taxonomy's contribution to society**.
- ❑ The **benefits** of timely, expert taxonomic inputs and information...
- ❑ ...and the **costs** of weak, inaccessible or inexistent taxonomic expertise and resources.
- ❑ The cash benefit of taxonomy is presented where possible to show **how taxonomy saves \$millions**.
- ❑ **38 published** online – so far.