

# « The French Connection »

## Lessons learned from the management of invasive alien plants in French Overseas tropical island Territories

Jean-Yves Hiro MEYER<sup>1\*</sup>, Yohann SOUBEYRAN<sup>2\*</sup>,  
Christophe LAVERGNE<sup>3\*</sup> & César DELNATTE<sup>4\*</sup>

<sup>1</sup>*Délégation à la Recherche, Gouvernement de la Polynésie française, Papeete, Tahiti, French Polynesia*

<sup>2</sup>*Comité français de l'UICN, UMR AMAP, Montpellier, France*

<sup>3</sup>*Conservatoire Botanique National de Mascarin, Saint-Leu, La Réunion, France*

<sup>4</sup>*Office National des Forêts, Martinique, France*

\* « Initiative sur les Espèces Exotiques Envahissantes en Outre-Mer »



# Global biotic homogenization / species mixing

## Invasive alien species in an era of globalization

Laura A Meyerson<sup>1\*</sup> and Harold A Mooney<sup>2</sup>

*Front Ecol Environ* 2007; 5(4): 199–208

## Critical issues and new challenges for research and management of invasive plants in the Pacific Islands

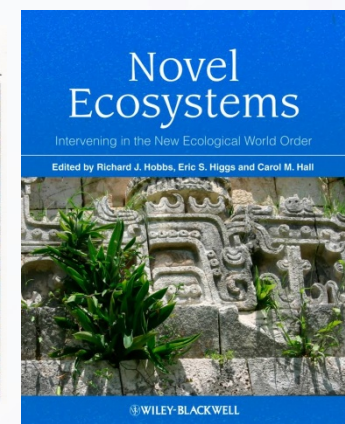
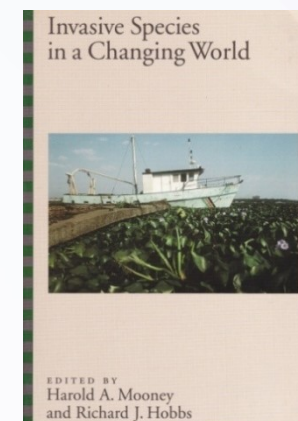
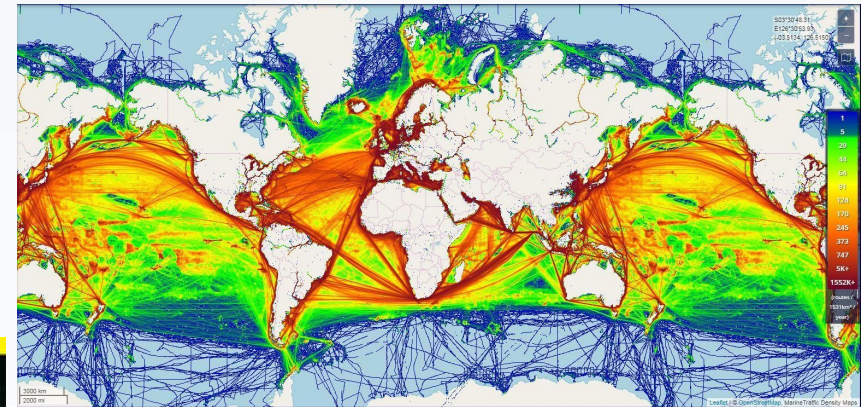
JEAN-YVES MEYER<sup>1</sup>

Table 1. Comparison between native and alien flora (flowering plants and ferns) in selected Pacific tropical islands (by size of terrestrial area) and number of naturalized and invasive alien plants (including dominant or major IAP).

| Island or island group   | Area (km <sup>2</sup> ) | Native flora (number of indigenous species) | Alien flora (number of introduced species) | Naturalized alien plant species | Invasive alien plant species | Dominant IAP    |
|--------------------------|-------------------------|---------------------------------------------|--------------------------------------------|---------------------------------|------------------------------|-----------------|
| New Caledonia            | 19 060                  | 3 261 <sup>a</sup>                          | 2 008 <sup>b</sup>                         | 597 <sup>b</sup>                | 97 <sup>a</sup>              | 67 <sup>b</sup> |
| Fiji                     | 18 270                  | 1 622 <sup>d</sup>                          | 977 <sup>d</sup>                           | 461 <sup>d</sup>                | 107 <sup>a</sup>             | 30 <sup>f</sup> |
| Hawai'i                  | 16 880                  | 1 138 <sup>e</sup>                          | 8 134 <sup>b</sup>                         | 1 104 <sup>i</sup>              | 469 <sup>i</sup>             | 86 <sup>j</sup> |
| Galápagos                | 7 900                   | 550 <sup>k</sup>                            | 870 <sup>l</sup>                           | 229 <sup>l</sup>                | 109 <sup>l</sup>             | 22 <sup>l</sup> |
| French Polynesia         | 3 519                   | 885 <sup>m</sup>                            | > 1 700 <sup>n</sup>                       | 593 <sup>n</sup>                | -                            | 57 <sup>n</sup> |
| Cook Is.                 | 238                     | 296 <sup>a</sup>                            | 997 <sup>a</sup>                           | 333 <sup>a</sup>                | 76 <sup>p</sup>              | 12 <sup>a</sup> |
| Rapa Nui (Easter Island) | 166                     | 48 <sup>c</sup>                             | 370 <sup>c</sup>                           | 180 <sup>c</sup>                | -                            | 36 <sup>c</sup> |
| Wallis et Futuna         | 142                     | 351 <sup>c</sup>                            | 338 <sup>c</sup>                           | 151 <sup>c</sup>                | -                            | 18 <sup>c</sup> |

<sup>a</sup>Jaffré *et al.* 2004, <sup>b</sup>Meyer *et al.* 2010, <sup>c</sup>Hequet *et al.* 2009, <sup>d</sup>Brownlie 1977 and Smith 1993, <sup>e</sup>GLD, <sup>f</sup>Meyer 2000, <sup>g</sup>Wagner *et al.* 1999, <sup>h</sup>Staples and Herbot 2005, <sup>i</sup>Staples and Cowie 2001, <sup>j</sup>Smith 1985, <sup>k</sup>Mauchamp 1997, <sup>l</sup>Trueman *et al.* 2010, <sup>m</sup>Florence *et al.* 2007, <sup>n</sup>Fourdrigniez and Meyer 2008, <sup>o</sup>McCormack 2007, <sup>p</sup>Space and Flynn 2002, <sup>q</sup>Meyer 2004, <sup>r</sup>Dubois *et al.* 2013, <sup>s</sup>Meyer 2008, <sup>t</sup>Morat *et al.*, <sup>u</sup>Meyer *et al.* 2010

<sup>1</sup>Délégation à la Recherche, Government of French Polynesia, B.P. 20981 Papeete, Tahiti. jean-yves.meyer@recherche.gouv.pf  
PACIFIC CONSERVATION BIOLOGY Vol. 20(2): 146–164. Surrey Beatty & Sons, Sydney. 2014.



## Invasive species do not respect borders!

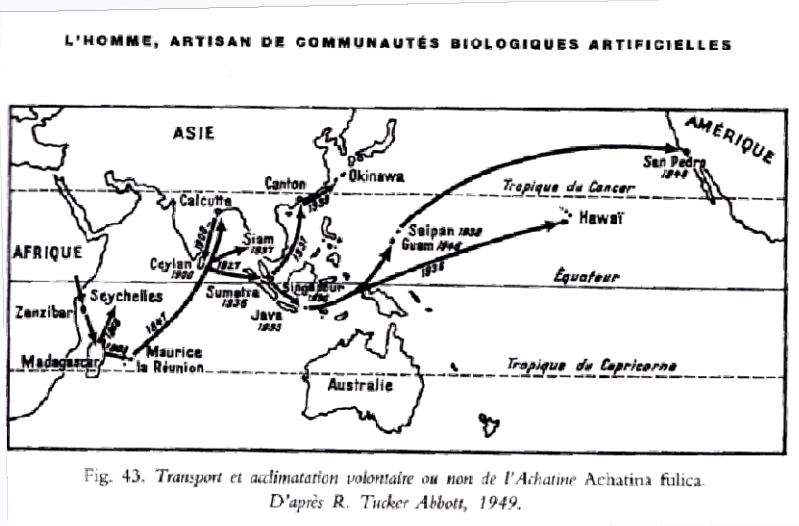
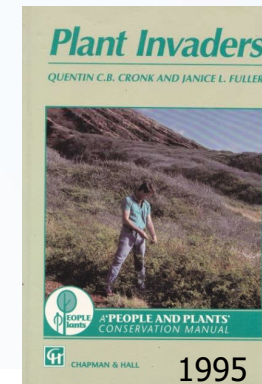


Fig. 43. Transport et acclimatation volontaire ou non de l'Achatine *Achatina fulica*.  
D'après R. Tucker Abbott, 1949.

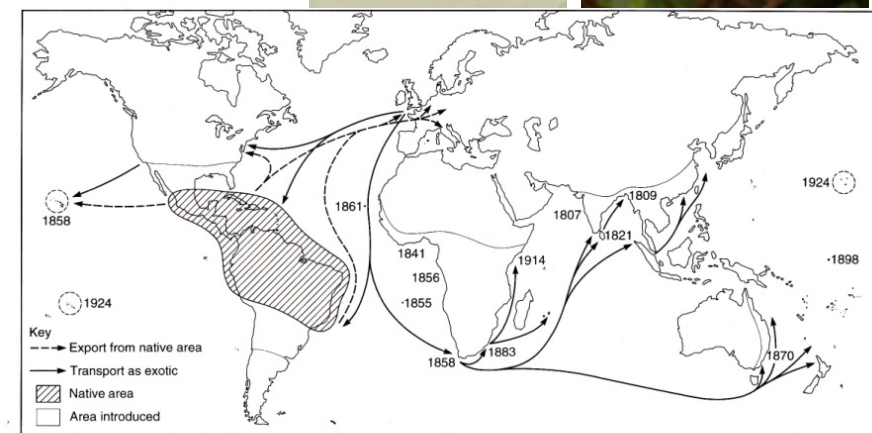


# The invasive land planarian *Platydemus manokwari* (Platyhelminthes, Geoplanidae): records from six new localities, including the first in the USA

Jean-Lou Justine<sup>1</sup>, Leigh Winsor<sup>2</sup>, Patrick Barrière<sup>3</sup>, Crispus Fana<sup>4</sup>,  
Delphine Gey<sup>5</sup>, Andrew Wee Kien Han<sup>6</sup>, Giomara La Quay-  
Velazquez<sup>7</sup>, Benjamin Paul Yi-Hann Lee<sup>8,9</sup>, Jean-Marc Lefevre<sup>10</sup>,  
Jean-Yves Meyer<sup>11</sup>, David Philippart<sup>12</sup>, David G. Robinson<sup>13</sup>,  
Jessica Thévenot<sup>14</sup> and Francis Tsatsis<sup>4</sup>

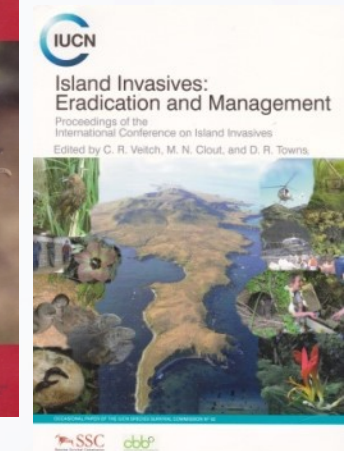
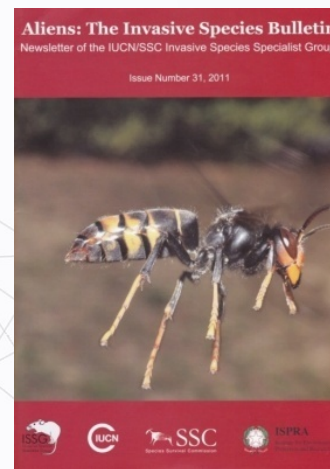
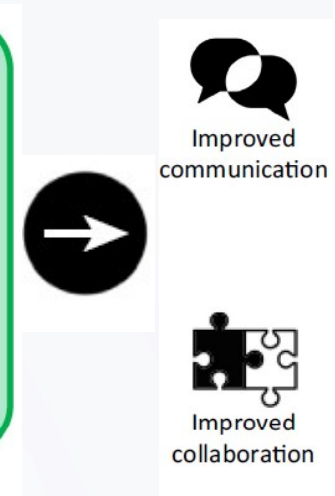
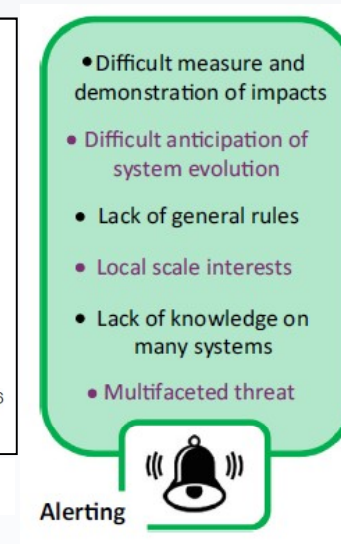
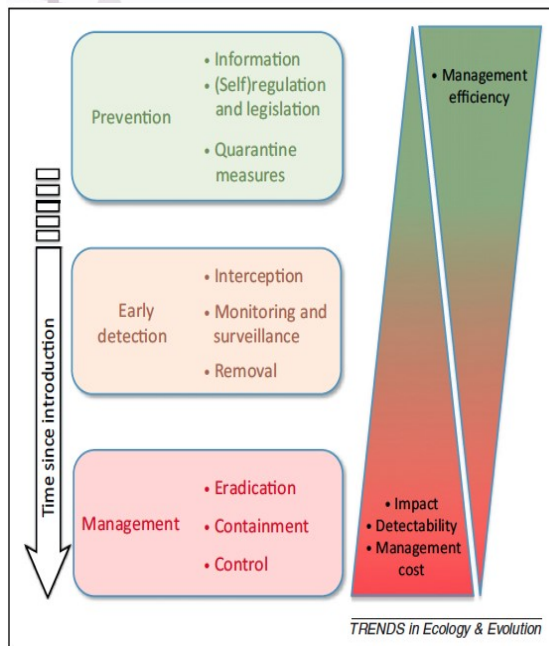
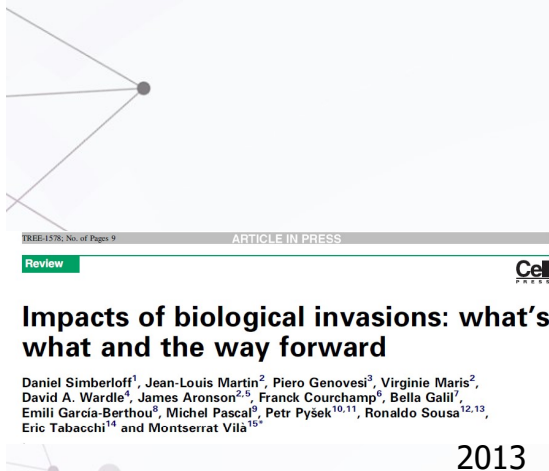


**Figure 7** *Platydemus manokwari*, map of distribution records. Blue: previous records (Justine et al., 2014); Red: new records reported in this paper.

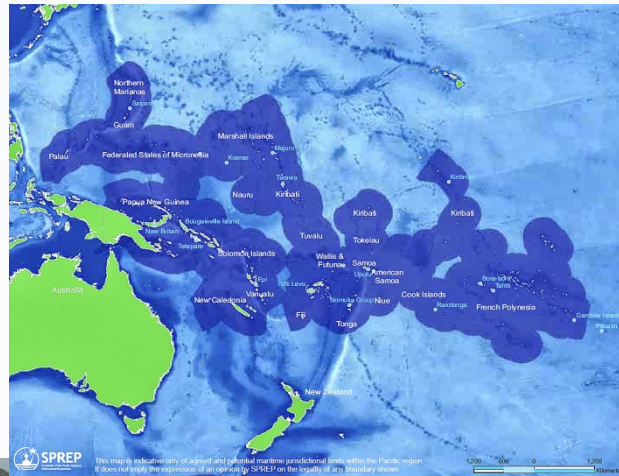
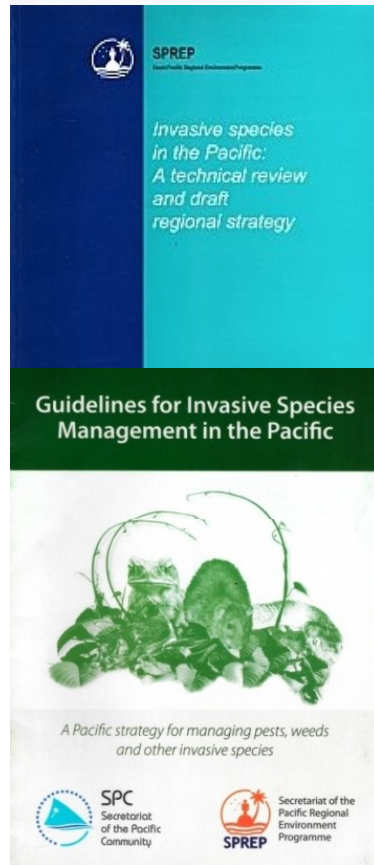


**Map 2** Transport of *Lantana camara* around the world. This species has become a major pest in many areas. (After Stirton (1978))

# The importance of networks and sharing data and experiences for invasive species management



## Existing networks in the Pacific Islands



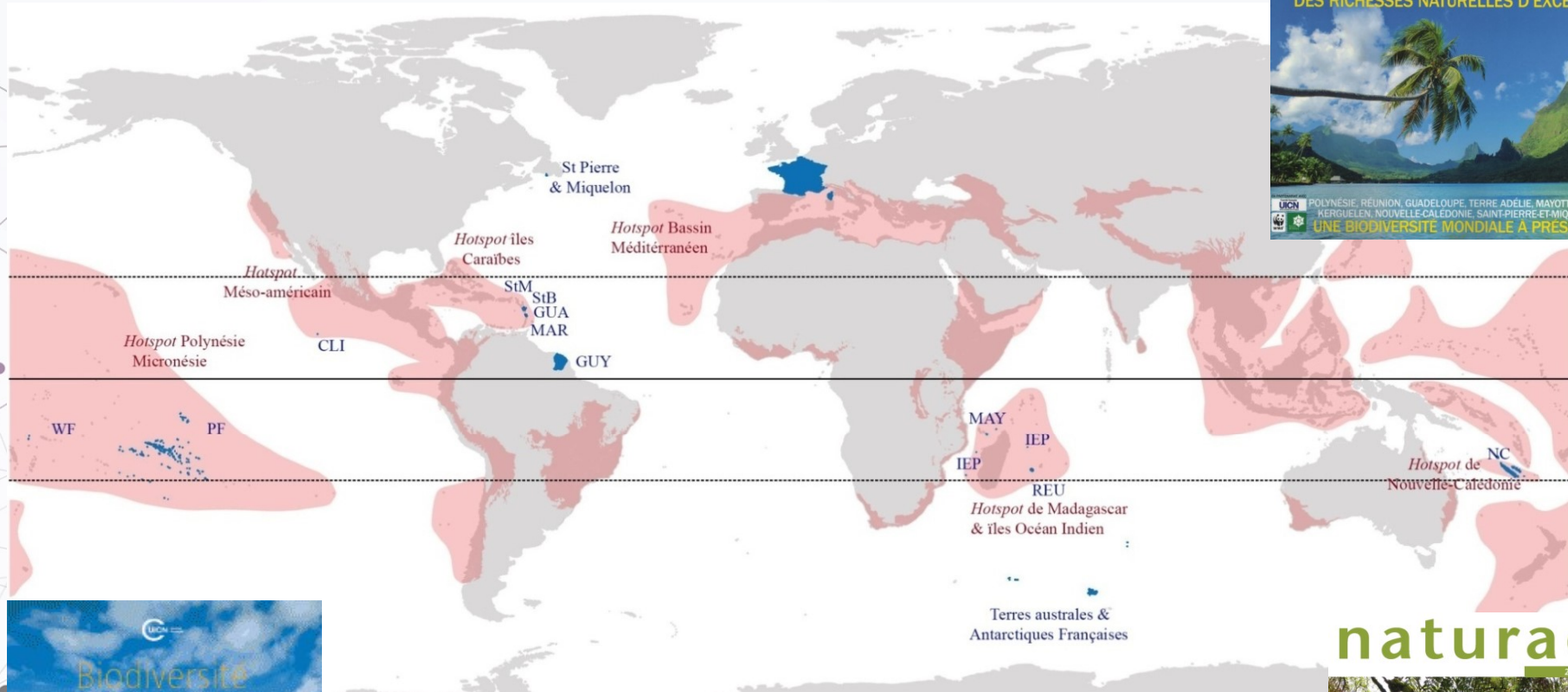
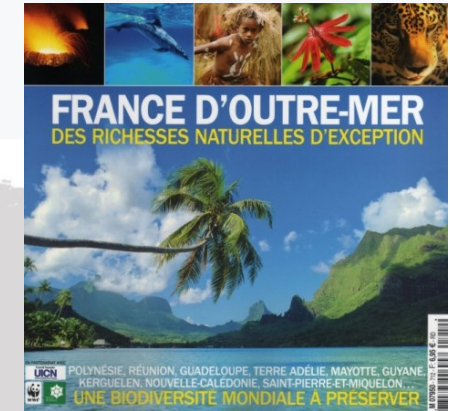
PILN meeting, Kiritimati, Kiribati 2012



PILN meeting, Moorea, French Polynesia 2007



# The French Overseas Island Territories



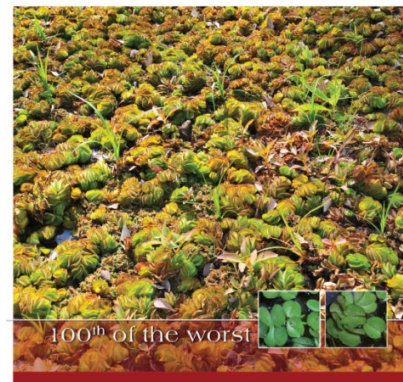
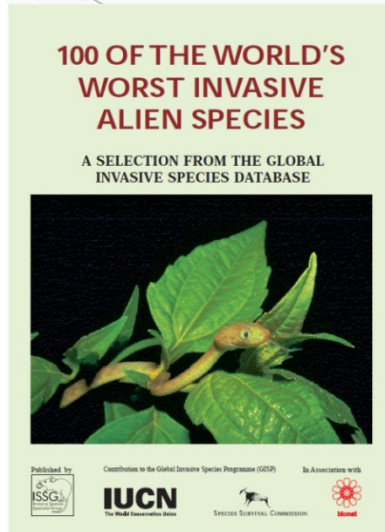
(Bocquet & Gargominy, coord. 2013)

- **11 tropical island territories (140+ main islands) in three oceans**
- **5 of the 36 “global biodiversity hotspots”**
- **70% of the ca. 18,000 terrestrial endemic plants and animals of France!**

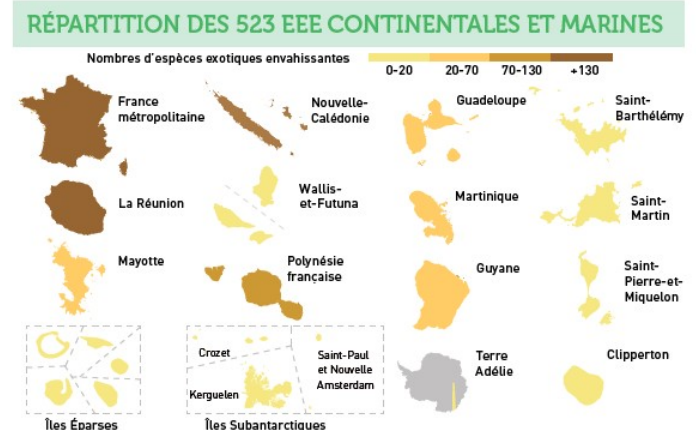


(Meyer *et al.*, 2018)

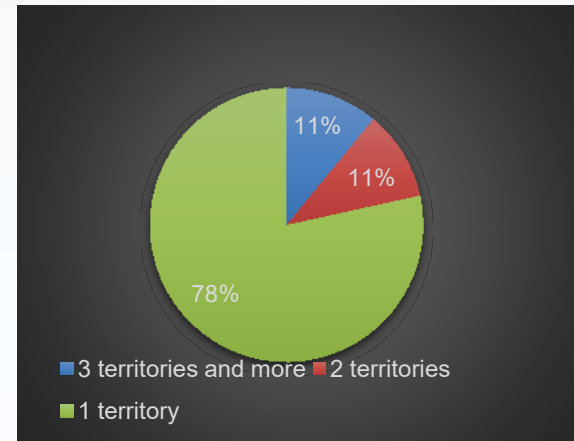
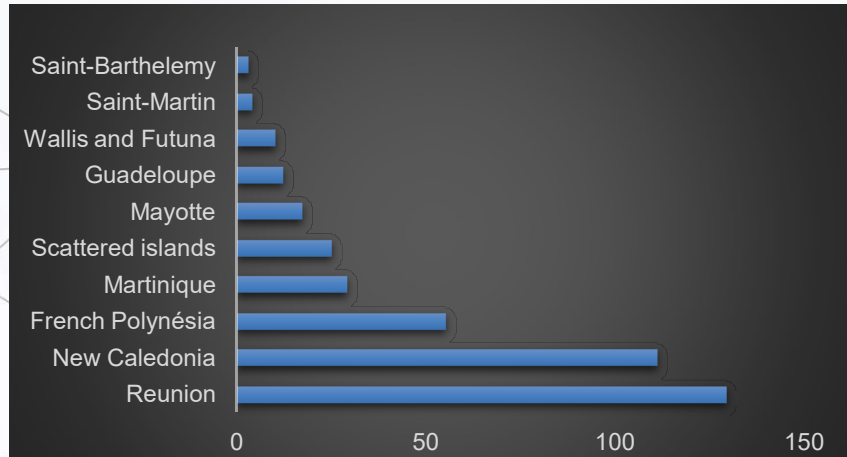
- **Half of the “100 World’s Worst IAS”!**
- **More than 300 invasive alien plants (excluding weeds)**



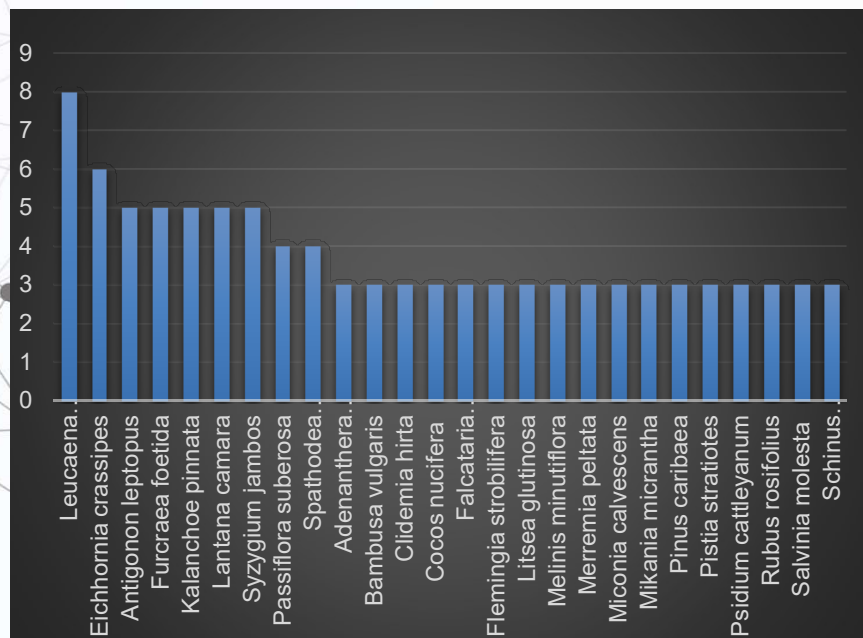
## LES ESPÈCES EXOTIQUES ENVAHISSANTES (EEE) 2019



## ➤ “Common pool” of invasive plants



3



➤ **Impacts on ecosystem structure, composition and dynamics** (“the transformers” *sensu* Richardson *et al.* 2000)

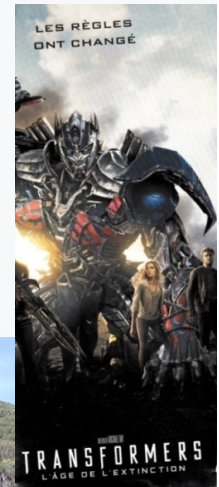
**Fire regime**



**Light availability & soil erosion**



**Light & water regime**



**Nutrient cycling**



**Plant succession**



**Water flow & quality**



## « Initiative sur les Espèces Exotiques Envahissantes en Outre-Mer »

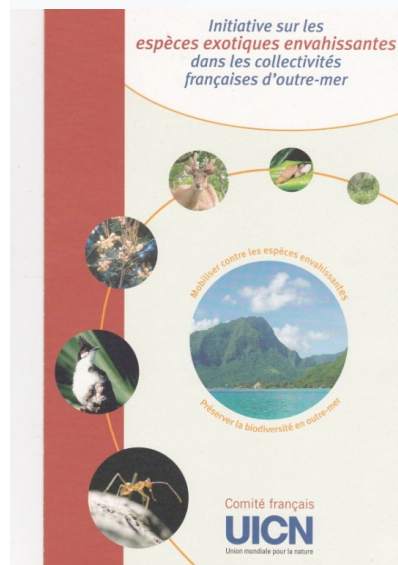


- **2005-on going**
- **12 local coordinators/focal points**
- **100+ French overseas and « continental » experts**

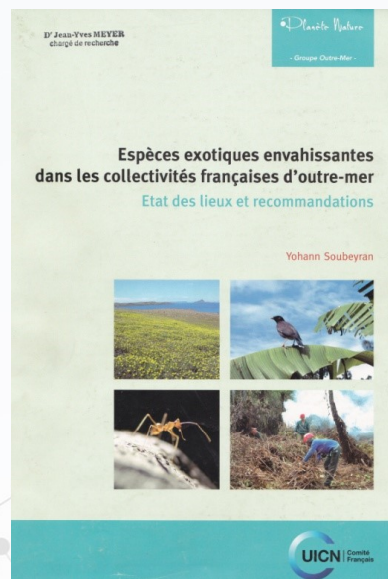


## ➤ Publishing

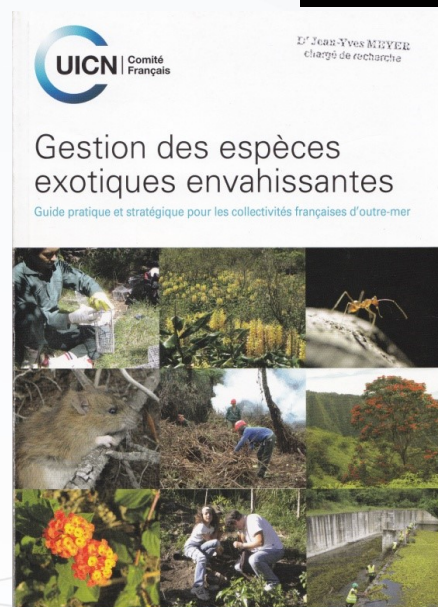
2007



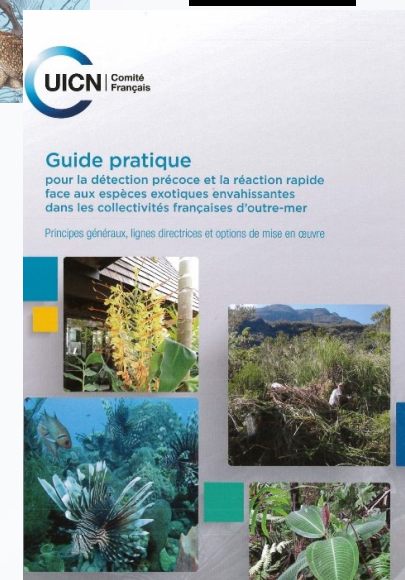
2008



2011



2015



2014

Biol Invasions  
DOI 10.1007/s10530-014-0766-2

### INVASION NOTE

## Dealing with invasive alien species in the French overseas territories: results and benefits of a 7-year Initiative

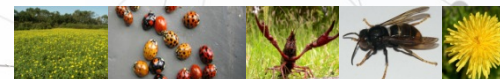
Yohann Soubeyran · Jean-Yves Meyer · Marc Lebouvier ·  
Benoit De Thoisy · Christophe Lavergne · Frank Urtizberea ·  
Florian Kirchner

2018



# Symposium “Invasive Species on Islands”, “Island Biology 2019”, La Réunion, 09 July 2019

## ➤ Promoting



Groupement de Recherche  
‘Invasions Biologiques’  
GdR CNRS InvaBio 3647



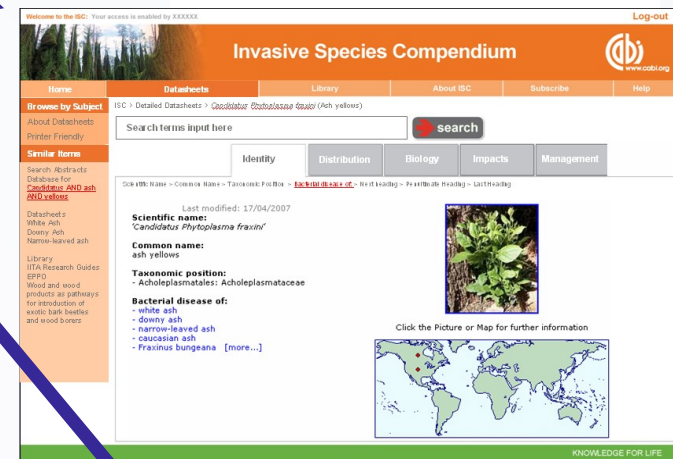
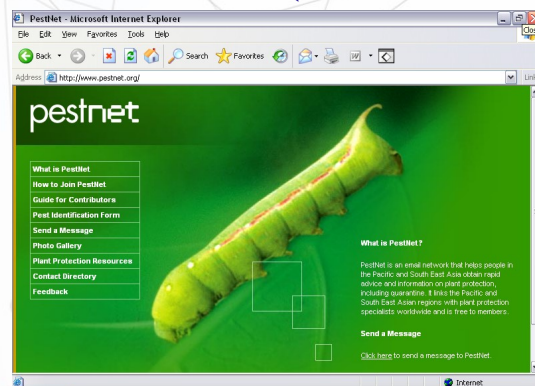
➤ Collecting and sharing data



ESPÈCES EXOTIQUES ENVAHISSANTES DANS  
LES COLLECTIVITÉS FRANÇAISES D'OUTRE-MER

[eee-outremer@uicn.fr](mailto:eee-outremer@uicn.fr)

[www.especes-envahissantes-outremer.fr](http://www.especes-envahissantes-outremer.fr)

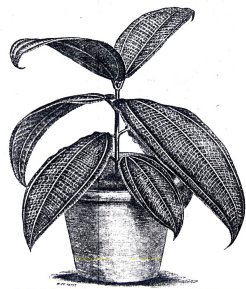
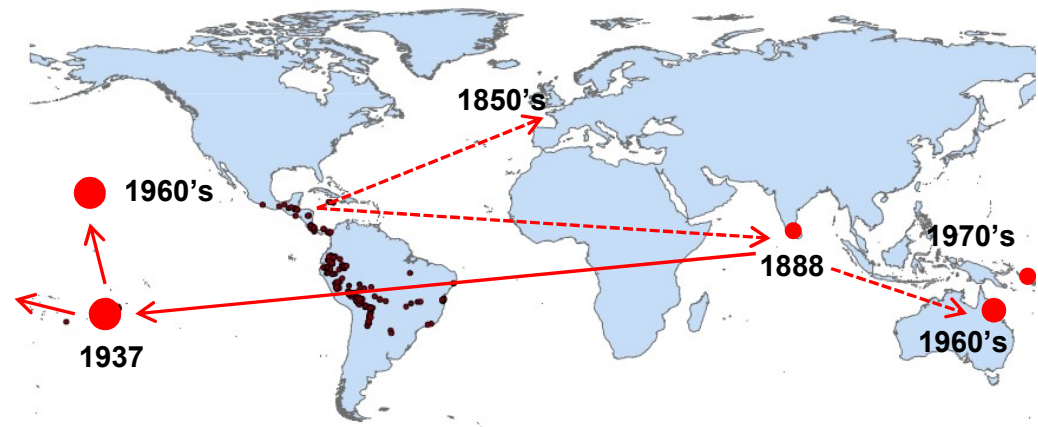


[www.issg.org/database](http://www.issg.org/database)



## Case study. The « purple plague » *Miconia calvenscens*

- Tahiti > 80,000 ha invaded
- Moorea > 3,500 ha
- Hawai'i (Big island) > 61,000 ha
- Maui > 12,000 ha
- North Queensland > 300 ha
- New Caledonia > 140 ha



(Biosecurity Queensland©)



Tahiti (E. Killgore©)



Maui, Hawai'i (P. Leary©)



Big Island, Hawai'i



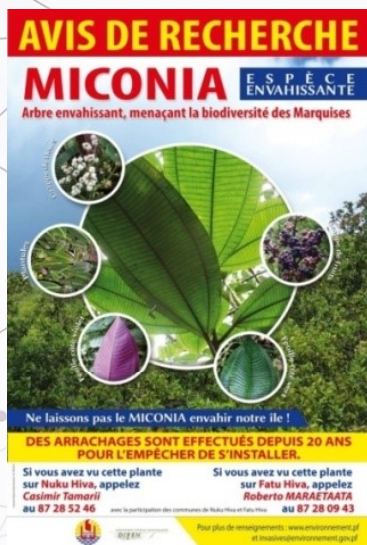
New Caledonia



Tahiti, French Polynesia

## ➤ Public awareness

## ➤ Biosecurity protocols



60 | pacifique

NOUVELLE-CALÉDONIE — Surnommé "le cancer vert" en Polynésie

## Le miconia menace les plantes endémiques



by Lara Reynolds

Department of Agriculture, Fisheries and Forestry  
Biodiversity & Conservation

## Pest alert

Declared Class 1

Miconia could be in your area.

Call Biosecurity Queensland on 13 25 23 if you see this pest.

- It invades rainforest areas and competes with native plant species.
- It's an aggressive tree up to 15 m.
- Fruit is spread by birds.
- The large leaves have prominent veins with a purple underside.
- Early detection helps protect Queensland's tourism industries and natural environment.



La Dépêche  
Comment nous contacter  
E-mail : [la@lapressepf.com](mailto:la@lapressepf.com)

Marqueses

NUKU HIVA — Les scientifiques inquiets face à sa prolifération

## Miconia, attention danger !

Le miconia est arrivé aux Marqueses dans les années 90. Depuis, cette plante invasive colonise les vallées et menace gravement la biodiversité locale, malgré les campagnes d'arrachage. Une équipe de scientifiques dresse actuellement la carte des zones déjà envahies et de celles susceptibles de l'être. Ce qu'ils ont déjà constaté sur le terrain les inquiète.



Depuis cinq à sept ans, les scientifiques de l'Institut de la Recherche en Polynésie française, en collaboration avec les services de l'État, ont constaté la présence de cette plante invasive dans les vallées de Nuku Hiva. Elle se propage rapidement et menace gravement la biodiversité locale. Les scientifiques ont dressé une carte des zones déjà envahies et de celles susceptibles de l'être. Ce qu'ils ont déjà constaté sur le terrain les inquiète.



25

Mercredi 27 septembre 2017

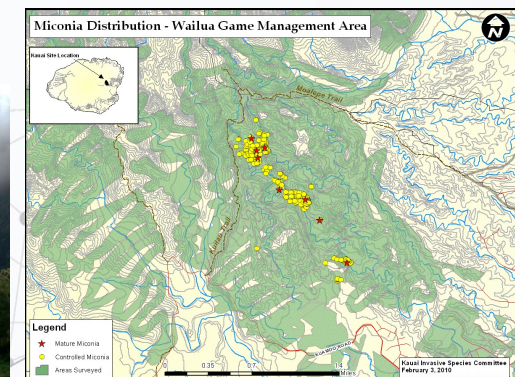
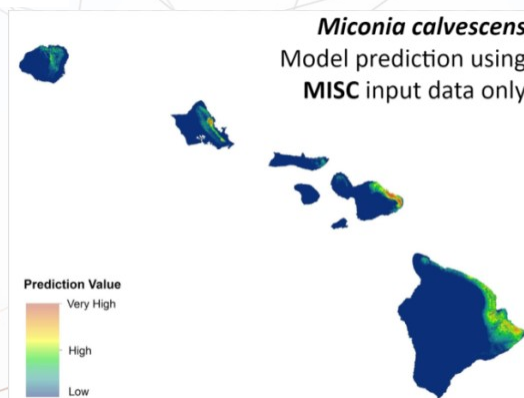
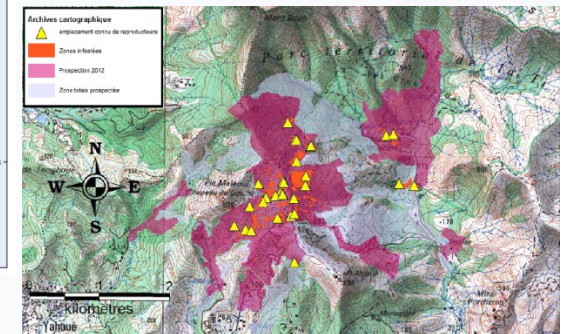
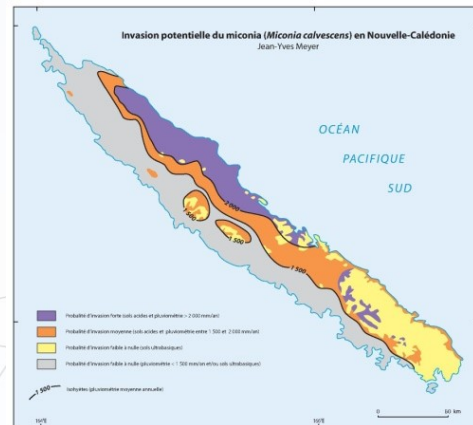
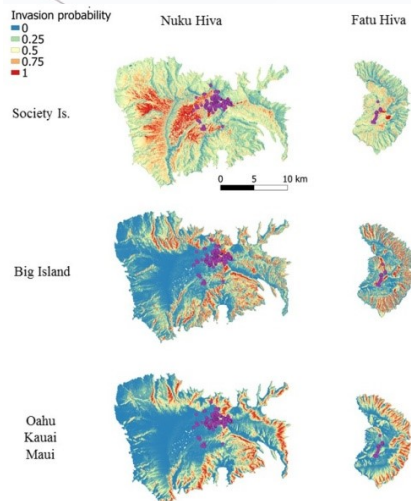
## ➤ Predicting the risks

- ❑ Distribution models and maps as warning tools for decision-makers
- ❑ Monitoring and field surveys (ground and aerial) for managers

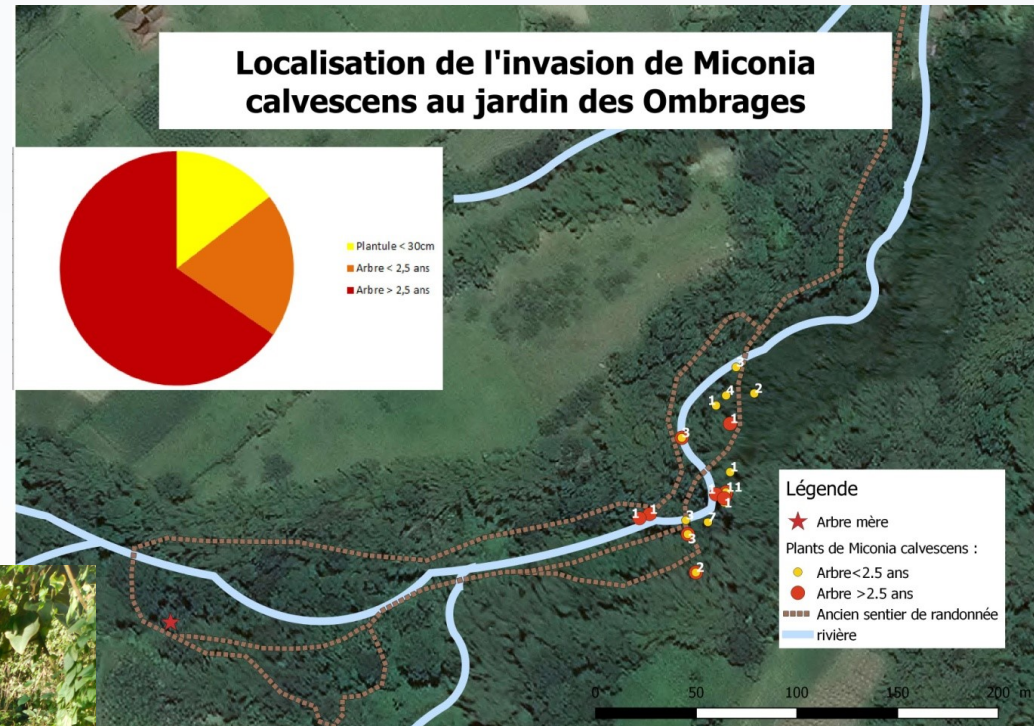
### Predicting the Invasion Risk of *Miconia calvenscens* in the Marquesas Islands (South Pacific): A Modeling Approach<sup>1</sup>

Mélanie Libeau,<sup>2,3</sup> Jean-Yves Meyer,<sup>2</sup> Ravabere Taputuarai,<sup>4</sup> and Robin Pouteau<sup>5,6,7</sup>

Pacific Science (2019), vol. 73, no. 1:17–34



## ➤ Early detection and control



2017

## ➤ Finding the next invaders!

Twelfth Australian Weeds Conference

### SLEEPER WEEDS

Richard Groves  
CSIRO Plant Industry and CRC Weed Management Systems,  
GPO Box 1600, Canberra, ACT 2601

I. Kowarik

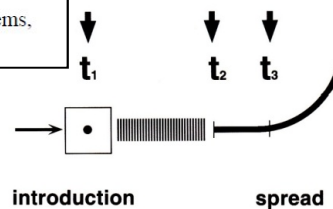


Fig. 1. The process of biological invasions including two kinds of lag phases: (a) the period between the first introduction to an area and the first spread (t2-t1), (b) the period preceding the switch to a significantly higher rate of population growth (t3-t2).

Diversity and Distributions, (Diversity Distrib.) (2004) 10, 333–347

BIODIVERSITY  
RESEARCH



### Beautés fatales: Acanthaceae species as invasive alien plants on tropical Indo-Pacific Islands

Jean-Yves Meyer\* and Christophe Lavergne†



PALMS

Meyer et al.: Invasive Palms Vol. 52(2) 2008

### Time Bombs in Gardens: Invasive Ornamental Palms in Tropical Islands, with Emphasis on French Polynesia (Pacific Ocean) and the Mascarenes (Indian Ocean)

JEAN-YVES MEYER  
Délégation à la Recherche  
B.P. 20981  
Papeete, Tahiti  
French Polynesia  
jean-yves.meyer@recherche.gov.pf

CHRISTOPHE LAVERGNE  
Association Palmyre-Union  
Domaine de Palmahoutoff  
97432 Ravine des Cabris  
La Réunion  
France

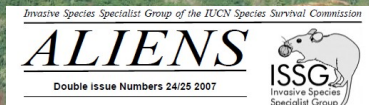
AND

DONALD R. HOEL  
University of California  
P.O. Box 22255  
Los Angeles, California  
90022  
USA



LasPalma (Canaries)

Tahiti (French Polynesia)



### The snake-like climber *Anodendron paniculatum* (Apocynaceae), a "new" invasive liana in the rainforests of Tahiti (Pacific Ocean)

*Anodendron paniculatum* A. DC. (syn. *A. manubrianum* Merr., *Echites paniculata* Roxb. Apocynaceae) is a large climbing and twining liana, native to India, Bangladesh, Burma, Sri Lanka, Southeast Asia (Thailand, Cambodia, Vietnam, Laos, Philippines) and Malaysia (Indonesia, Malaysia). The species is characterized by terminal or axillary panicles up to 15cm long, each bearing small white or yellowish tubular flowers; and by large fruits (paired follicles or "pods" up to 16cm long, 3cm wide, black when ripe) containing small flattened seeds (1-2cm long, 0.6-0.8mm wide), each attached to a long white silky coma (or "tuft") 5-9cm long. In its native range, this huge twiner is often more than 20m tall and is found in evergreen or secondary forests up to 1700m elevation.



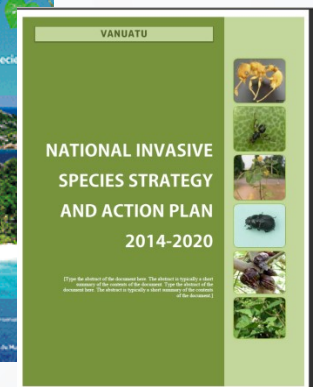
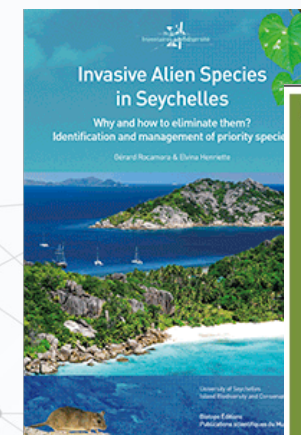
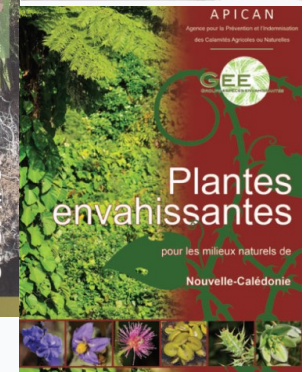
*A. paniculatum* seed Photo: Jean-Yves Meyer

Known as a medicinal plant in India and used for making fishing nets in Sri Lanka, *Anodendron paniculatum* was



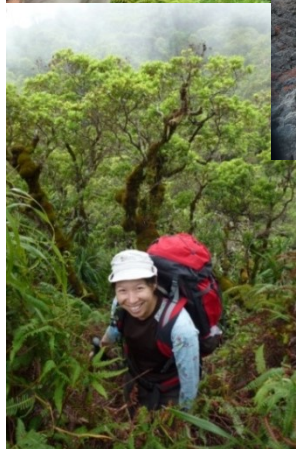
## Conclusions

- Building a network of national and local experts = **better capacity building**
- Updating IAS assessments in each territory = **better knowledge**
- Publishing toolkits/guidelines of best practices = **better management**
- Setting up IAS local committees with local strategies in each territory = **better governance**
- **More regional cooperation (with non-French countries and territories!)**
- **May inspire other initiatives, networks and collaborative projects on IAS at a regional scale... or on other critical conservation issues (biodiversity, ecosystem services, restoration, climate change...)!**





**Thank you**  
for your attention  
**Mauruuru roa!**



INITIATIVE SUR LES  
ESPÈCES EXOTIQUES  
ENVAHISSANTES  
EN OUTRE-MER



<https://especes-envahissantes-outremer.fr/>