

# On tropical mistletoes

Noteworthy advances, recent insights,  
emerging opportunities

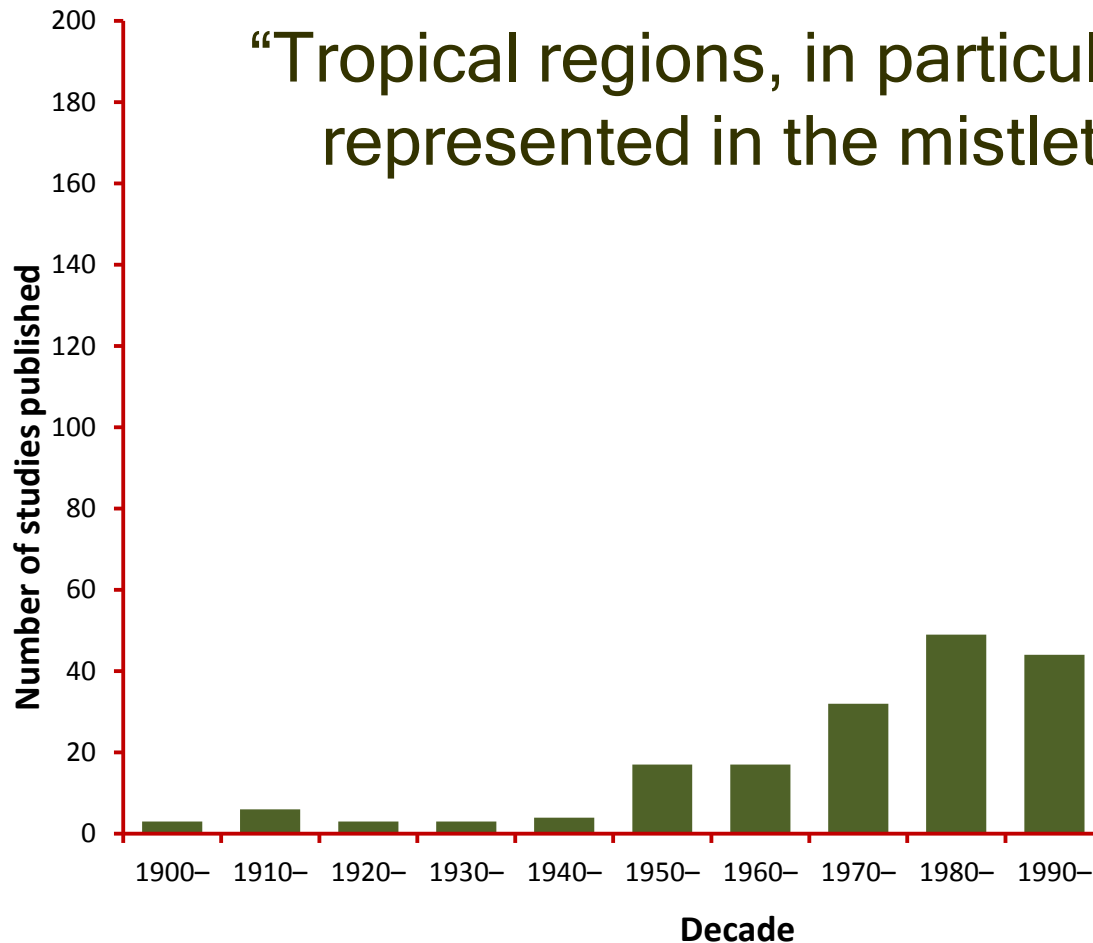


**David M Watson**  
Professor in Ecology





# Mistletoe ecology

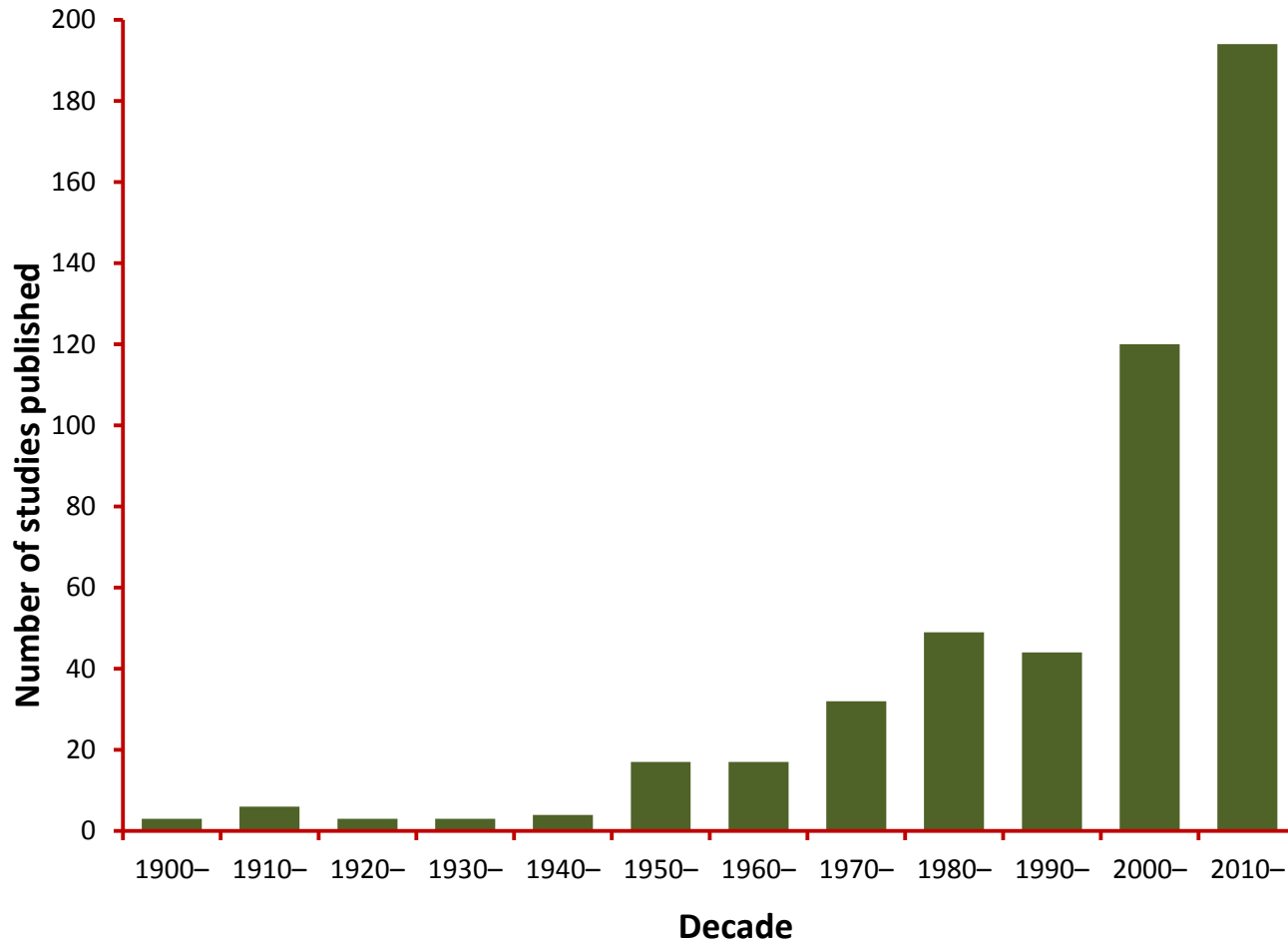


“Tropical regions, in particular, are under-represented in the mistletoe literature”

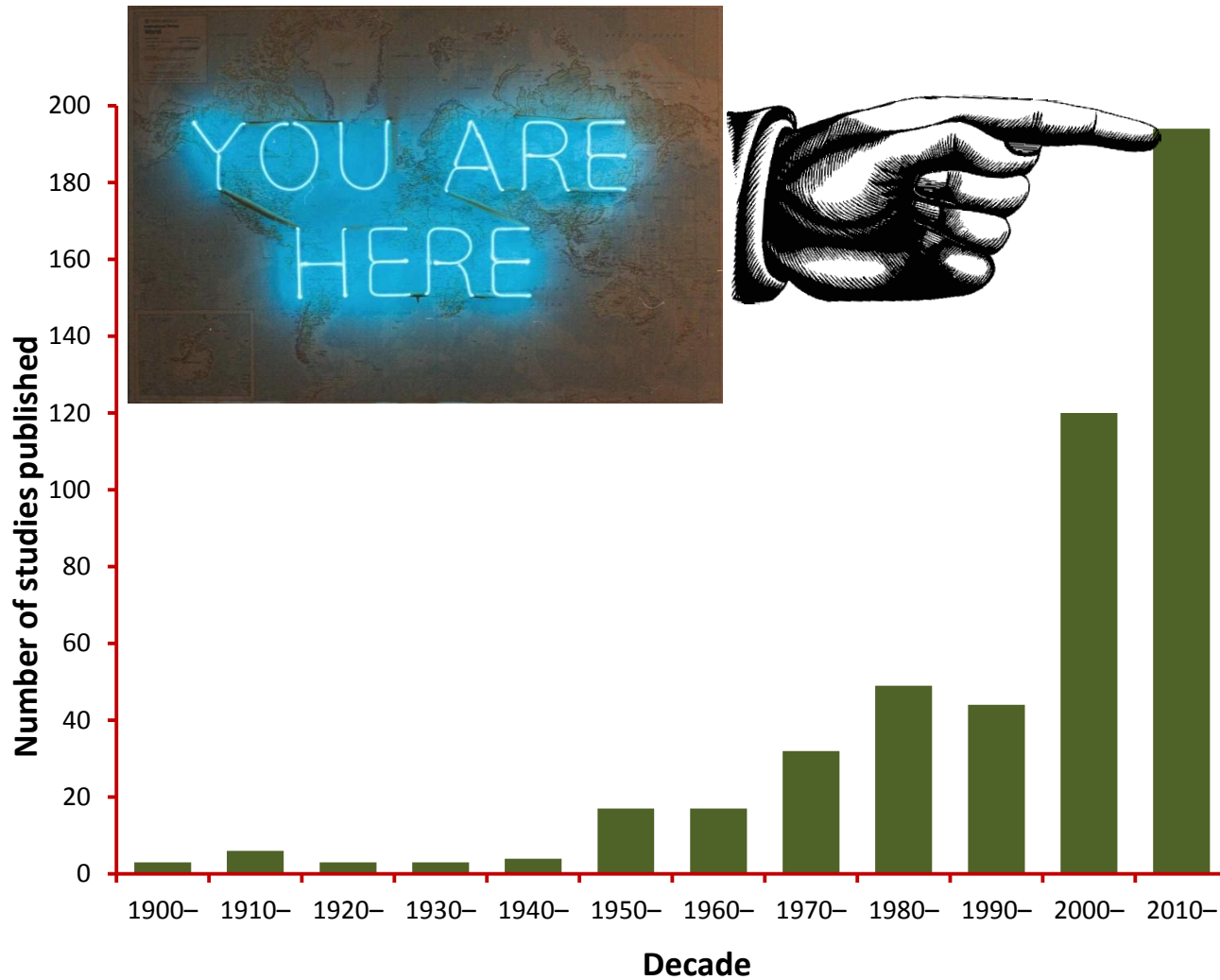
Watson 2001\*

No. peer-reviewed studies per decade derived from systematic survey: Google Scholar, search terms ‘tropical’ and ‘mistletoe’

# Mistletoe ecology



# Mistletoe ecology



## New species and range extensions from Mt Namuli, Mt Mabu and Mt Chipirone in northern Mozambique

T. Harris<sup>1</sup>, I. Darbyshire<sup>1</sup> & R. Polhill<sup>1</sup>

**Summary.** The three sections of this paper report (i) new species and range extensions from northern Mozambique and (ii) expansion of distribution for Mozambique and (iii) expansion of distribution for Mozambique. Specimens have been collected from a collecting programme from 2006 to 2008 in



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## Discovery through photography: *Amyema nickrentii*, a new species of Loranthaceae from Aurora Province, Philippines

PIETER B. PELSER & JULIE F. BARCELONA

*School of Biological Sciences, University of Canterbury, Private Bag 4800, Christchurch 8140, New Zealand.*  
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DOI: <http://dx.doi.org/10.11646/phytotaxa.266.1.8>

Open Access Subscription Access

## *Lepeostegeres cebuensis* (Loranthaceae), a new mistletoe species from Cebu, Philippines

PIETER B. PELSER, DANIEL L. NICKRENT, ANDREW R. T. REINTAR, JULIE F. BARCELONA

### Abstract

*Lepeostegeres cebuensis* leaves and internodes. International Union for

### Keywords

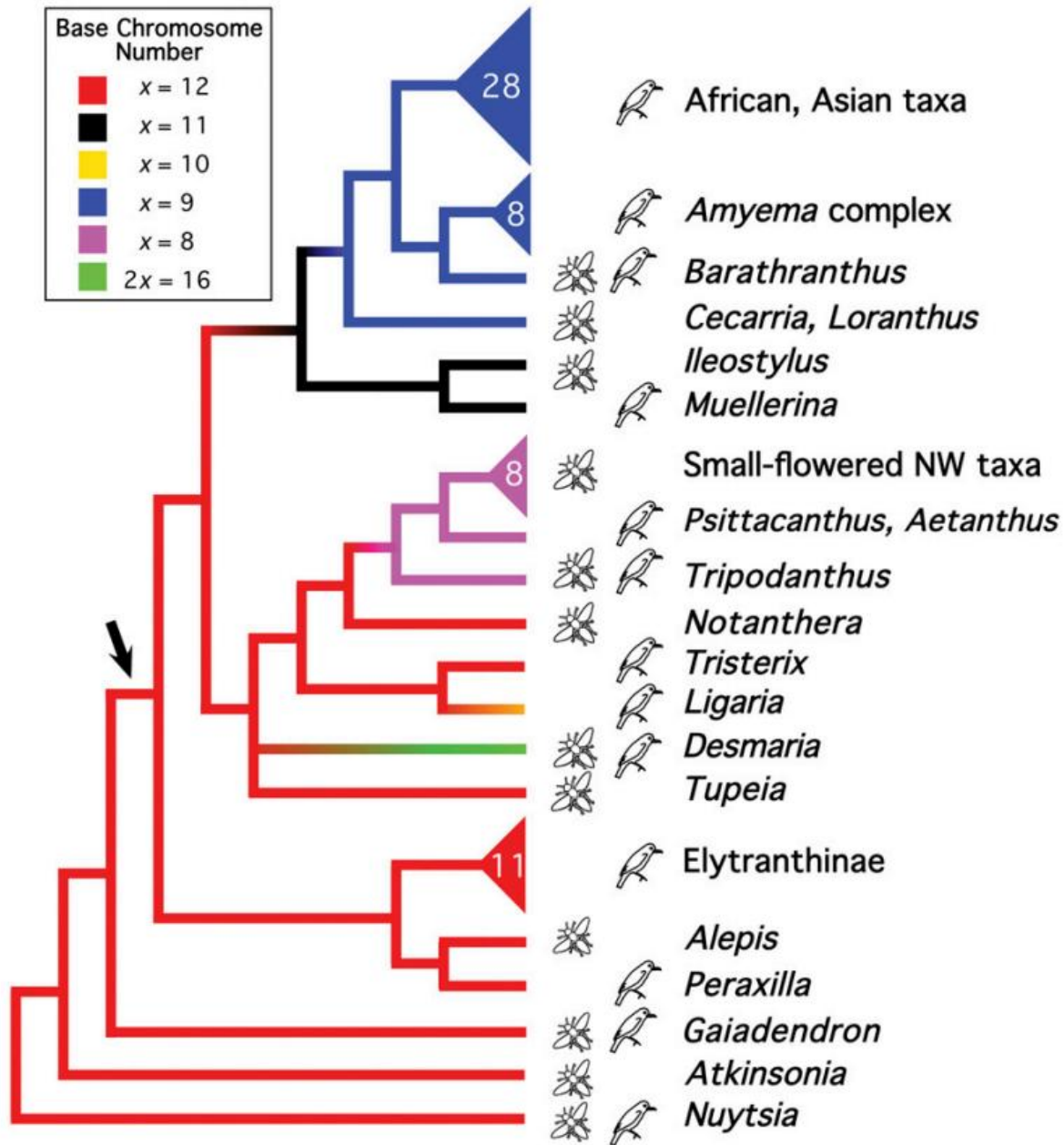
Alcoy, Nug-as forest, p

## Miscellaneous mistletoe notes, 48–60: Descriptions of twelve new species of Loranthaceae and Viscaceae

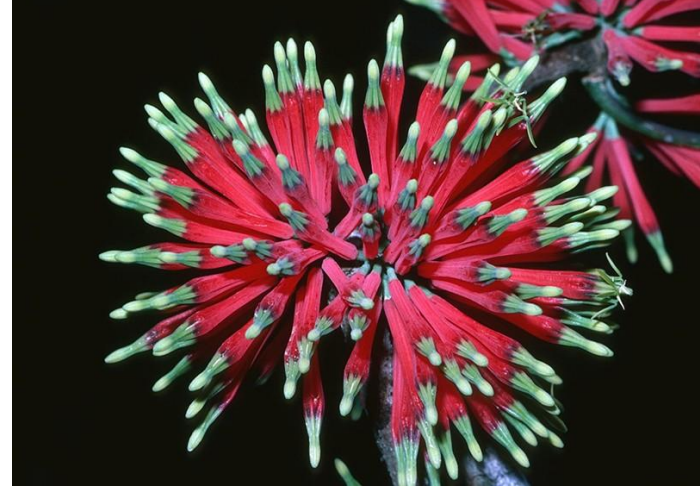
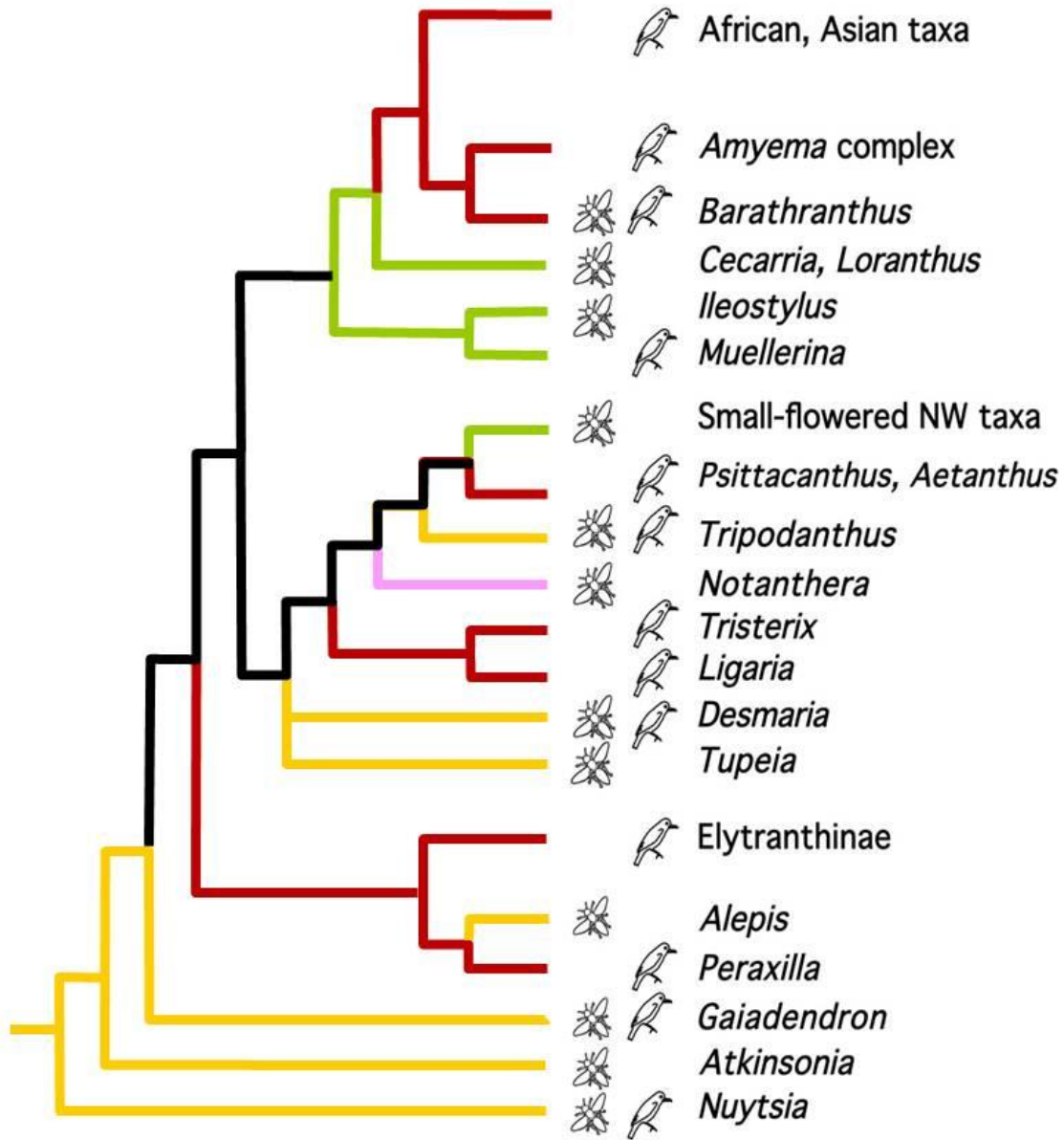
JOB KUIJT

Department of Biology, University of Victoria, Victoria, BC V8W 3N5, Canada; e-mail: [jkuijt@uvic.ca](mailto:jkuijt@uvic.ca)

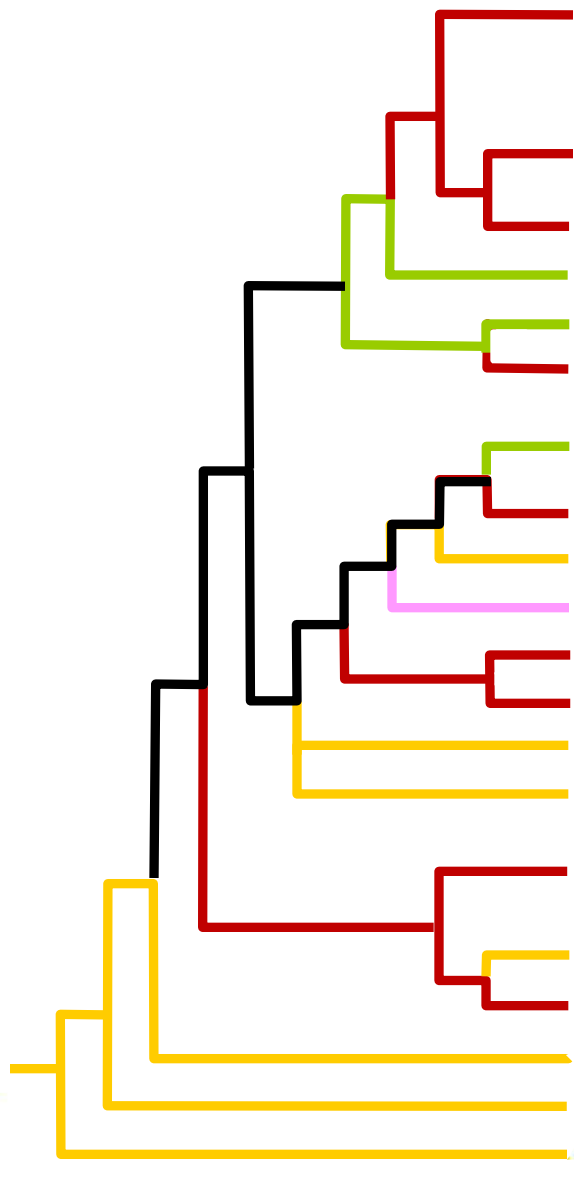
s of orange-brown scales on the young (DD) following the Red List Criteria of the




























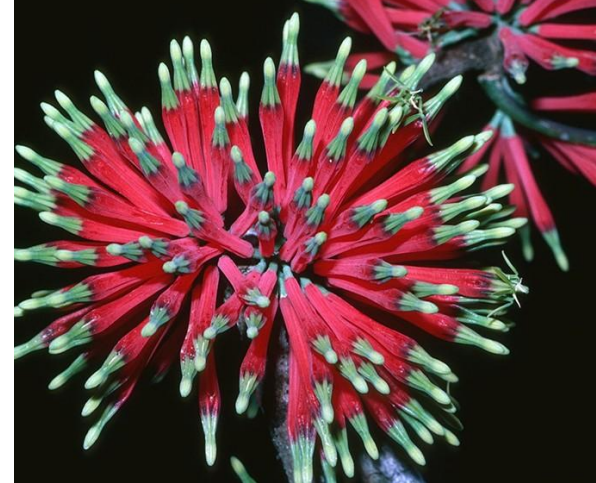
- Five genes
  - Nuclear
  - Small & large subunit rDNA
  - Chloroplast
- Confirmed monophyly
- Three root parasites basal
- Progressive reduction in karyotype

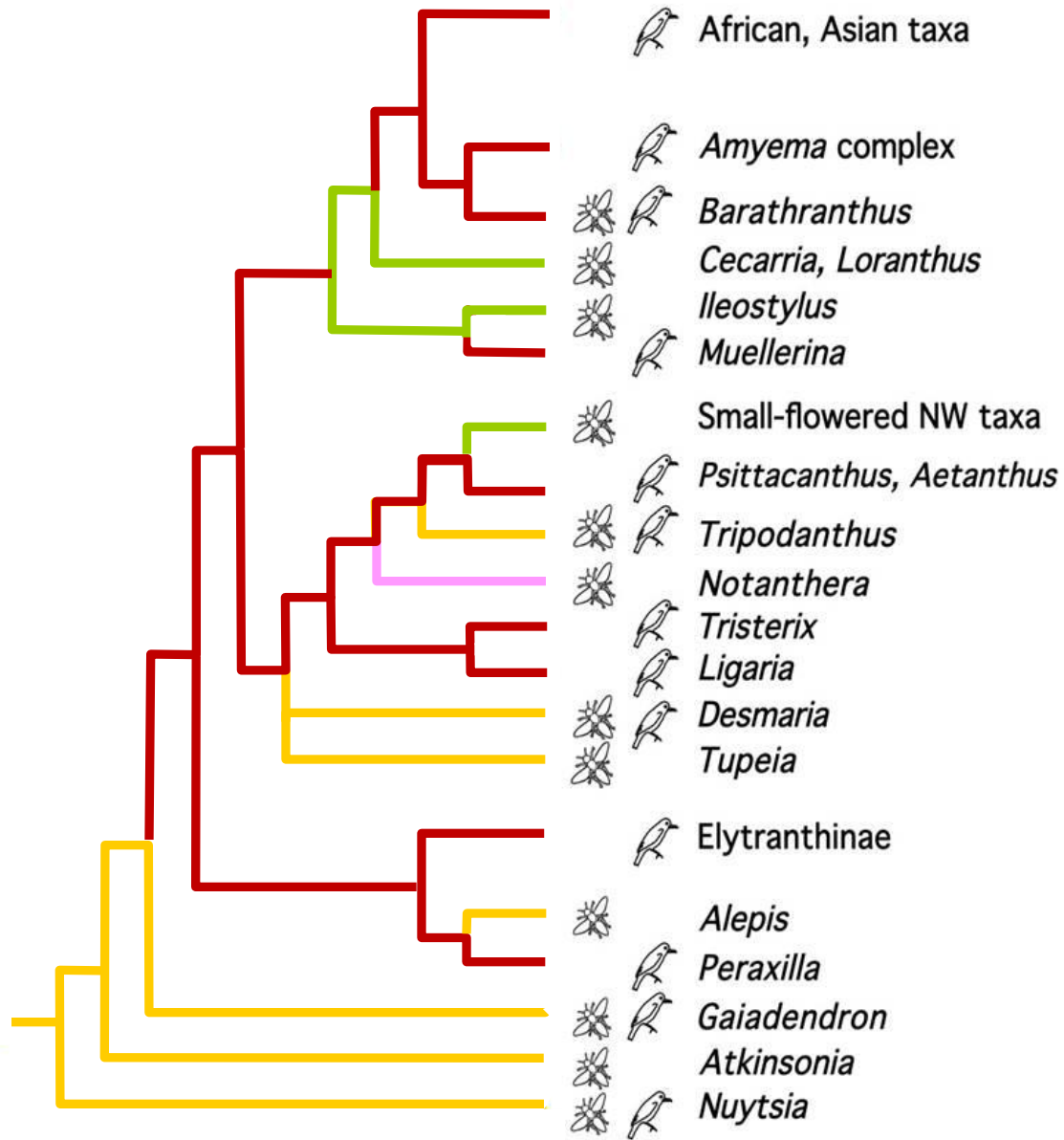


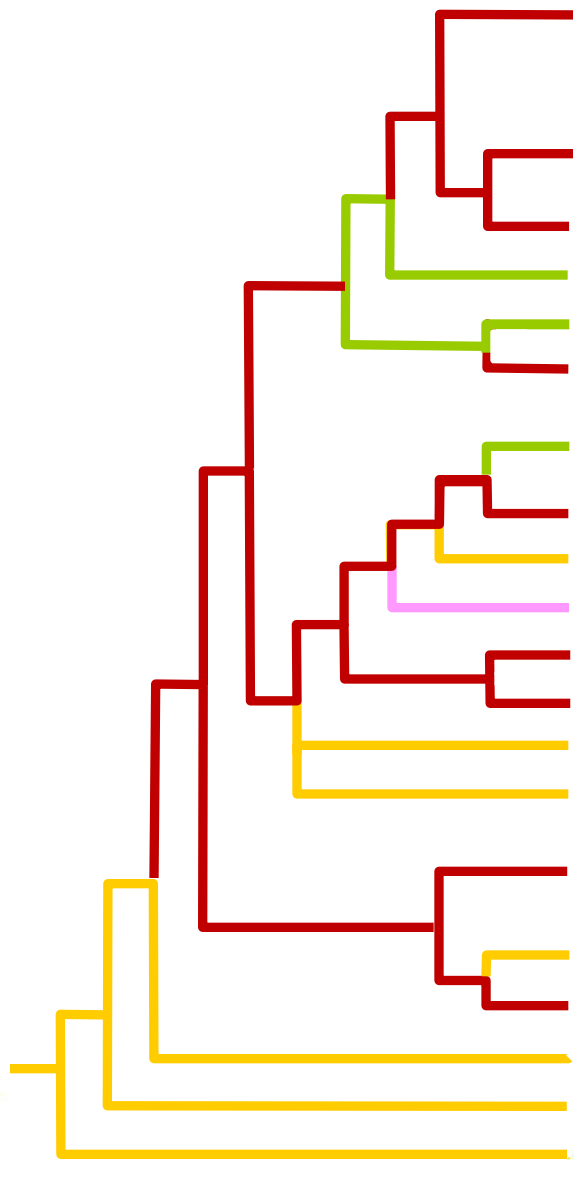





-  African, Asian taxa
-  *Amyema* complex
-   *Barathranthus*
-  *Cecarria, Loranthus*
-  *Ileostylus*
-  *Muellerina*
-  Small-flowered NW taxa
-  *Psittacanthus, Aetanthus*
-   *Tripodanthus*
-  *Notanthera*
-  *Tristerix*
-  *Ligaria*
-   *Desmaria*
-  *Tupeia*
-  Elytranthinae
-  *Alepis*
-  *Peraxilla*
-   *Gaiadendron*
-  *Atkinsonia*
-   *Nuytsia*









 African, Asian taxa

 *Amyema* complex

  *Barathranthus*

 *Cecarria*, *Loranthus*


 *Ileostylus*


 *Muellerina*

 Small-flowered NW taxa

 *Psittacanthus*, *Aetanthus*


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 *Tupeia*

 Elytranthinae

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  *Gaiadendron*

 *Atkinsonia*

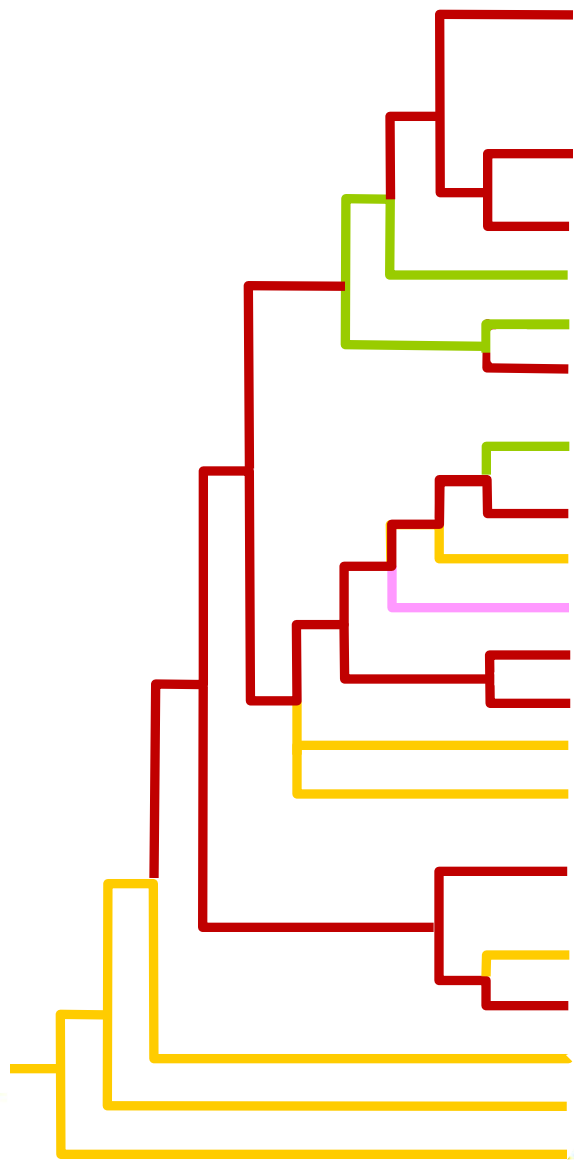
  *Nuytsia*


























Tui on *Peraxilla colensoi*  
©University of Canterbury



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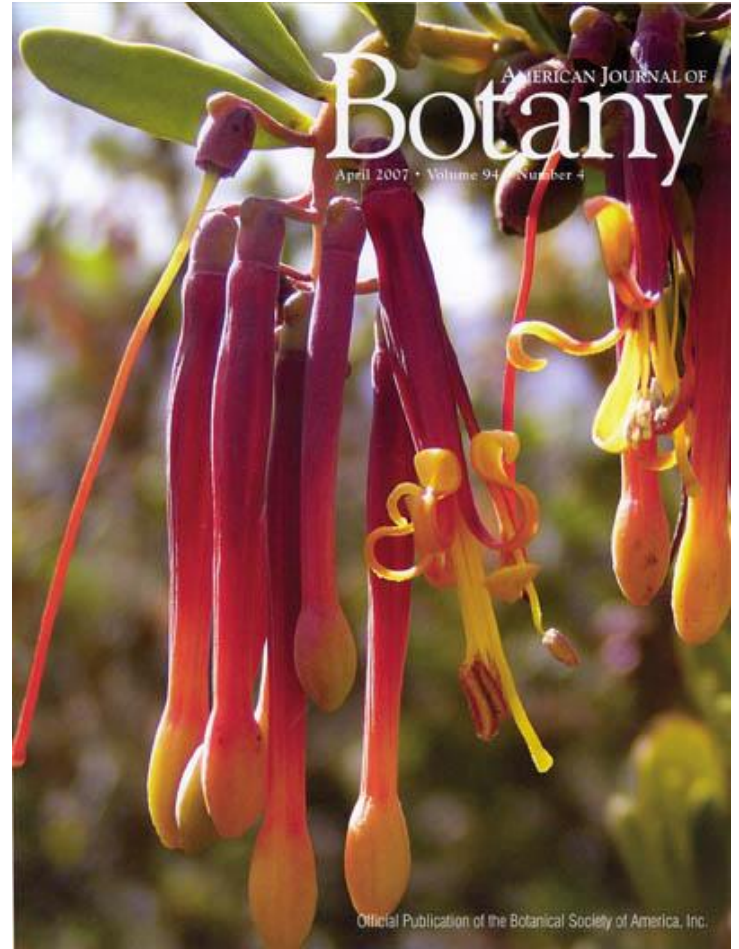




-  African, Asian taxa
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-   *Gaiadendron*
-  *Atkinsonia*
-   *Nuytsia*



# Trait evolution in *Tristerix*

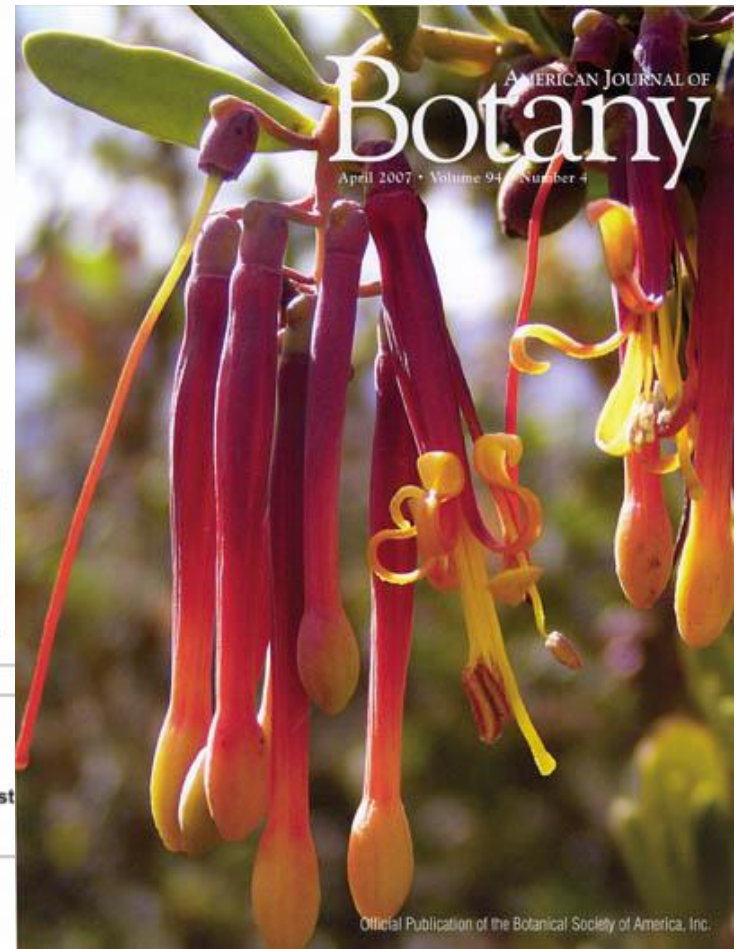
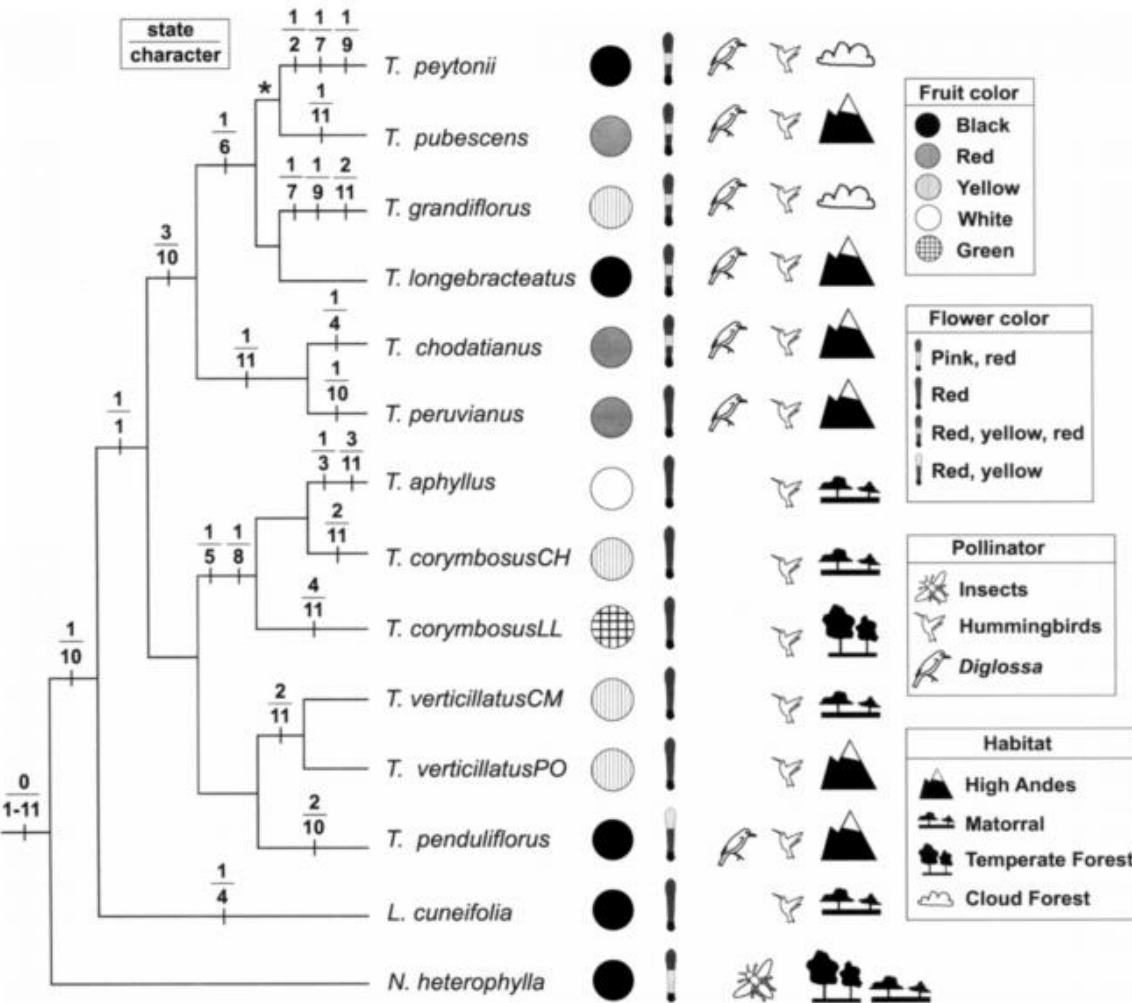


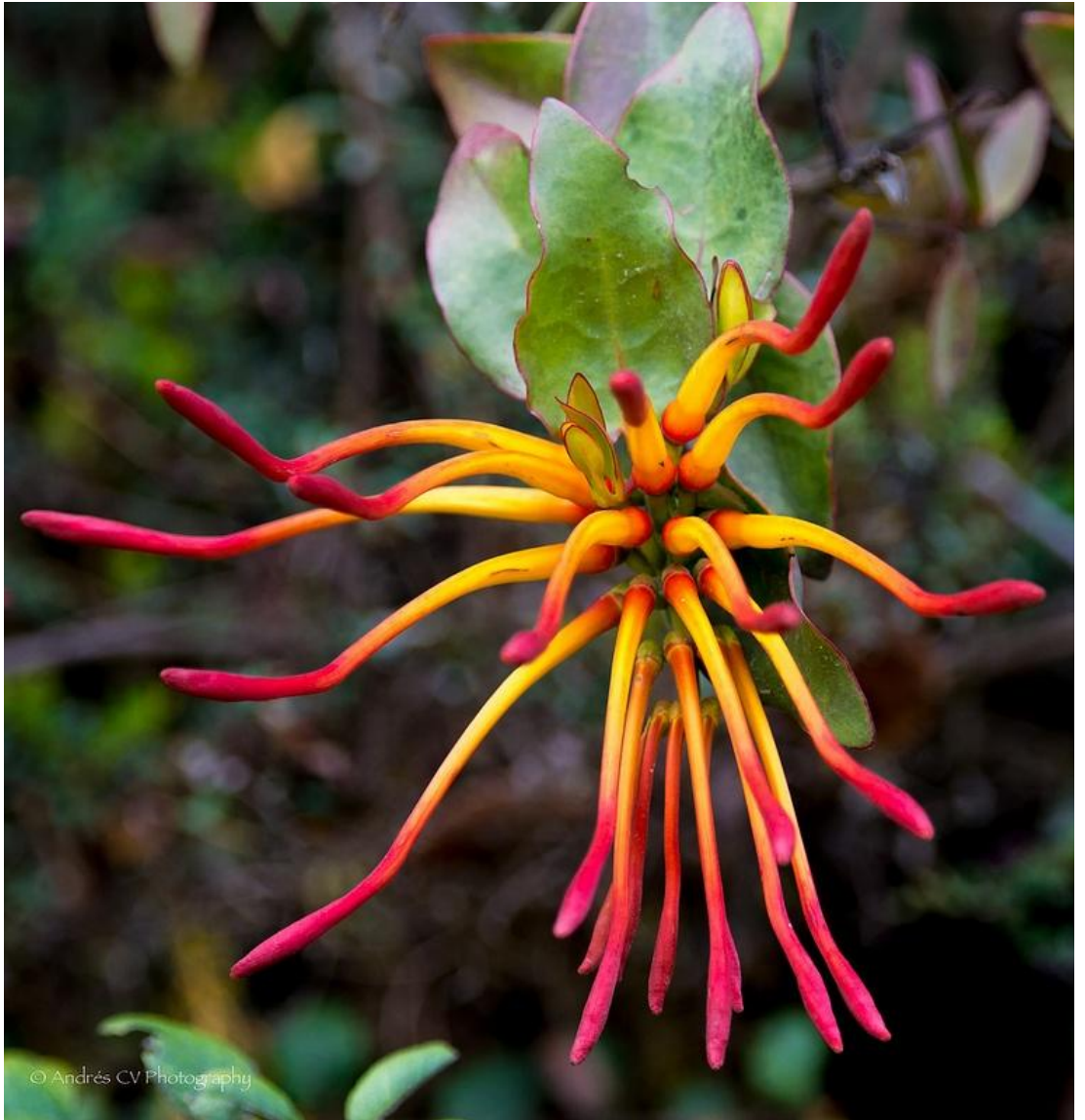
# Trait evolution in *Tristerix*

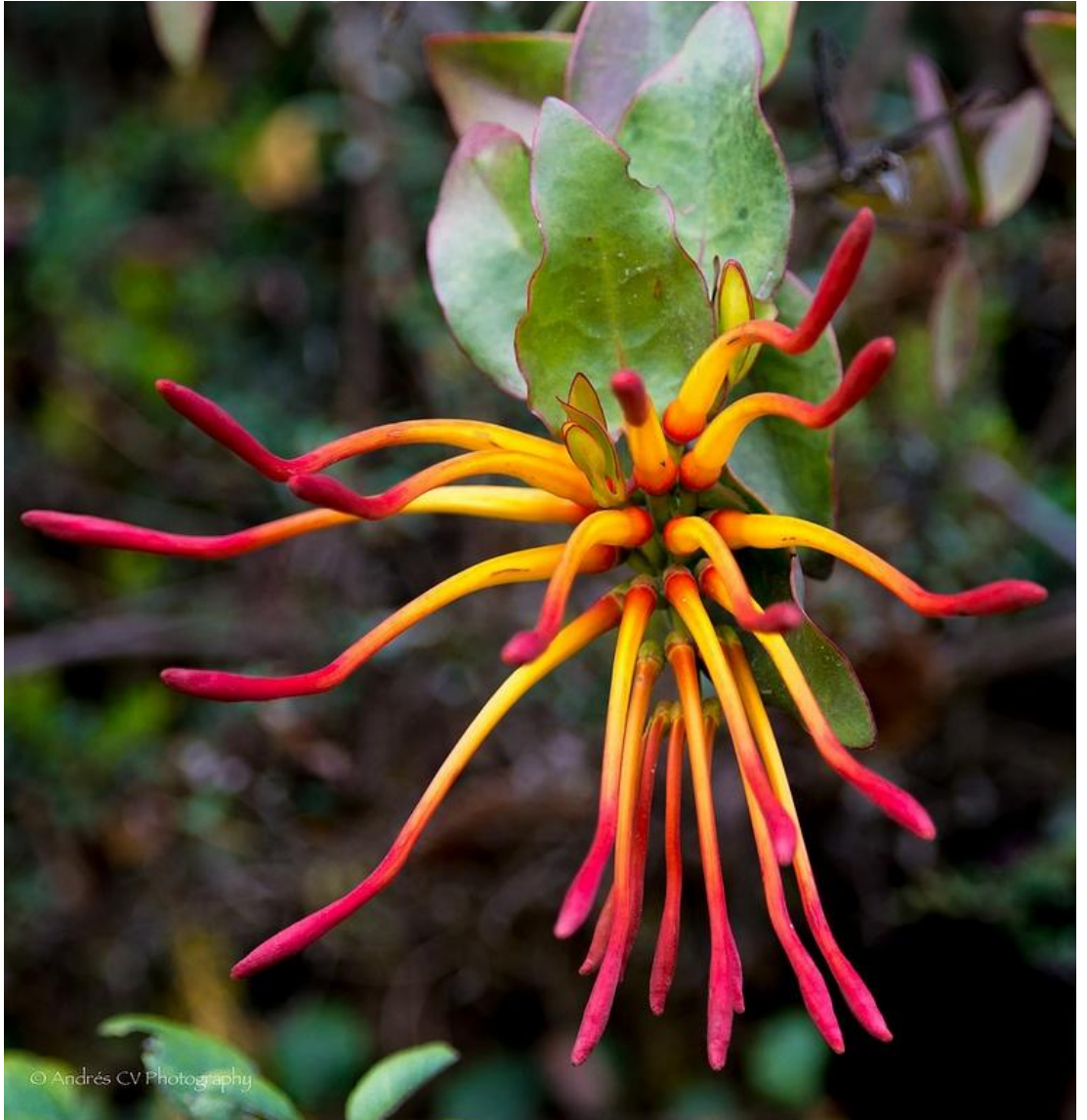
April 2007]

AMICO ET AL.—PHYLOGENY AND SPECIATION IN *TRISTERIX*

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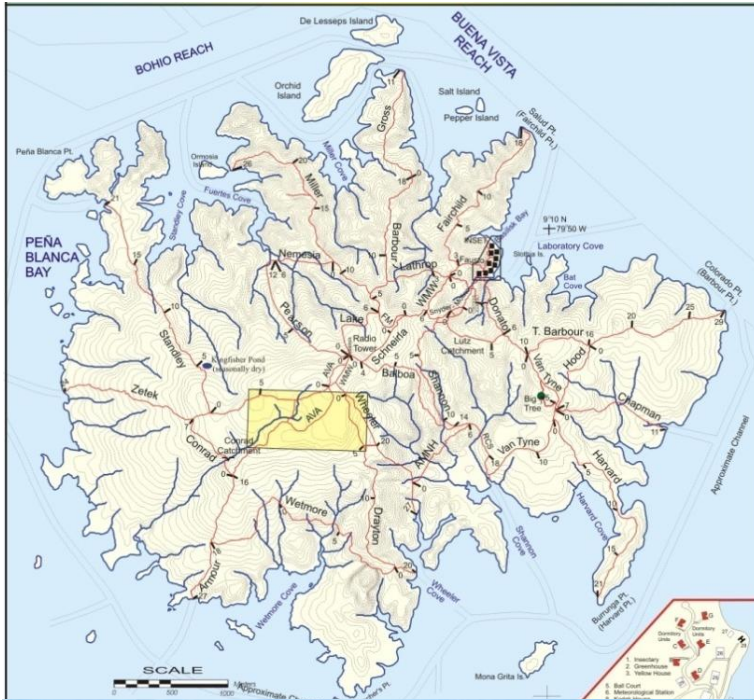






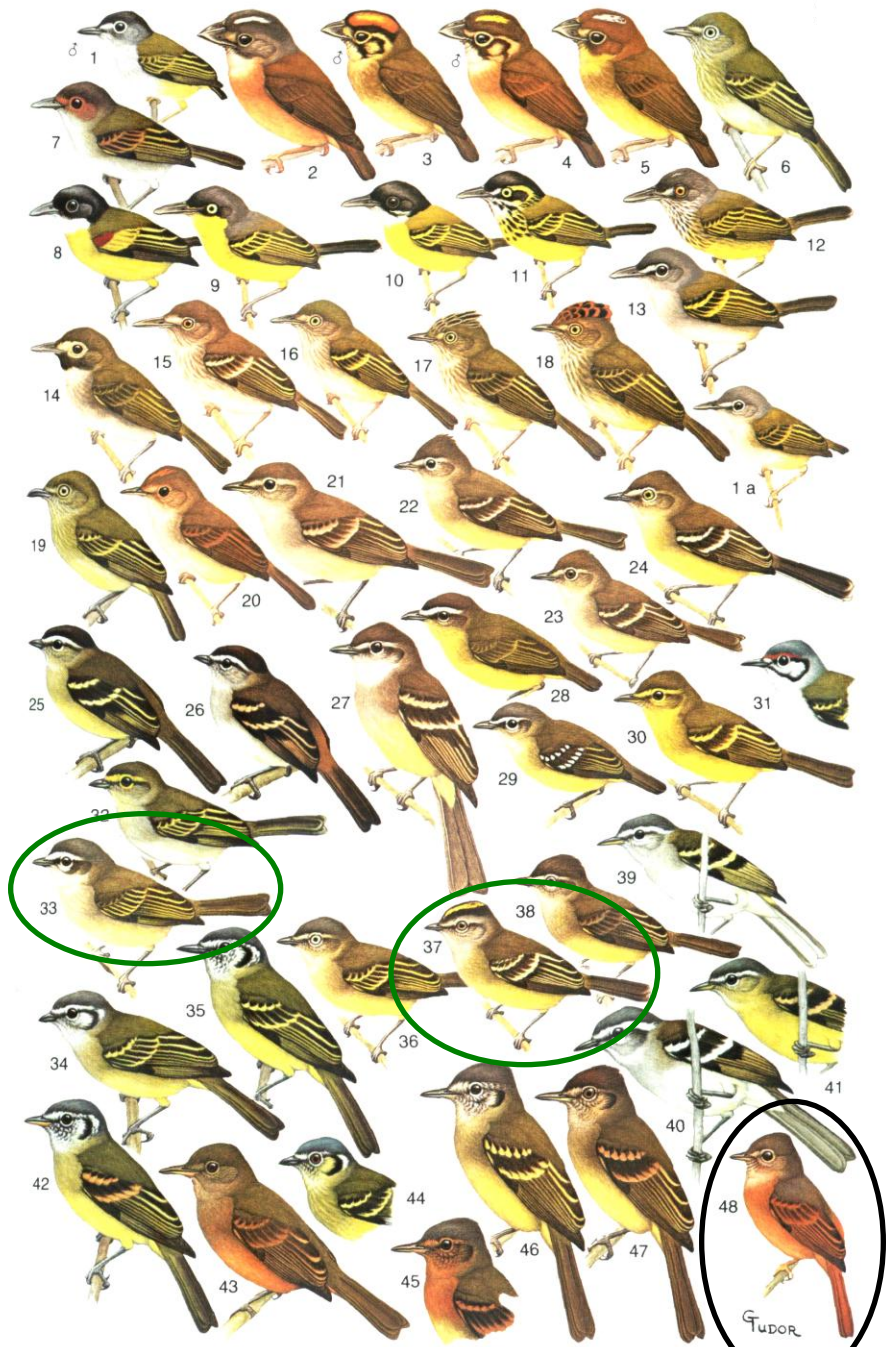
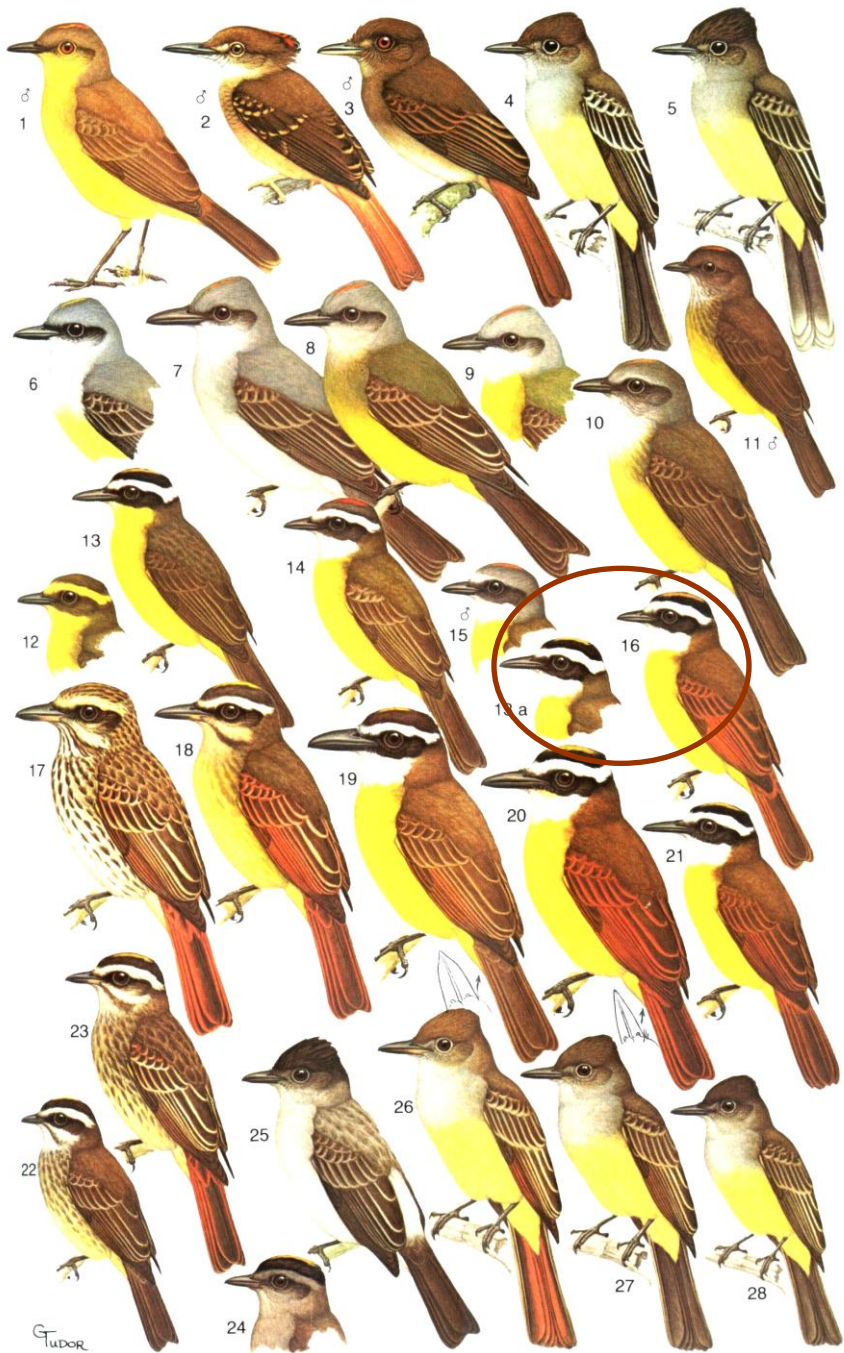


# Who disperses mistletoe?



**Q: What proportion of seed is dispersed by specialists, generalist and opportunists?**

- Barro Colorado Island, Panama
- Most frequently observed host: *Luhea seemannii* (Malvaceae)
- Selected 8 individuals infected with *Oryctanthus occidentalis*
- Conducted 201 half hour watches
- Noted spp., duration of visit, behaviour, interactions, feed rate



**Mistletoe species**

**Specialists**

**Generalists**

**Opportunists**

**Source**

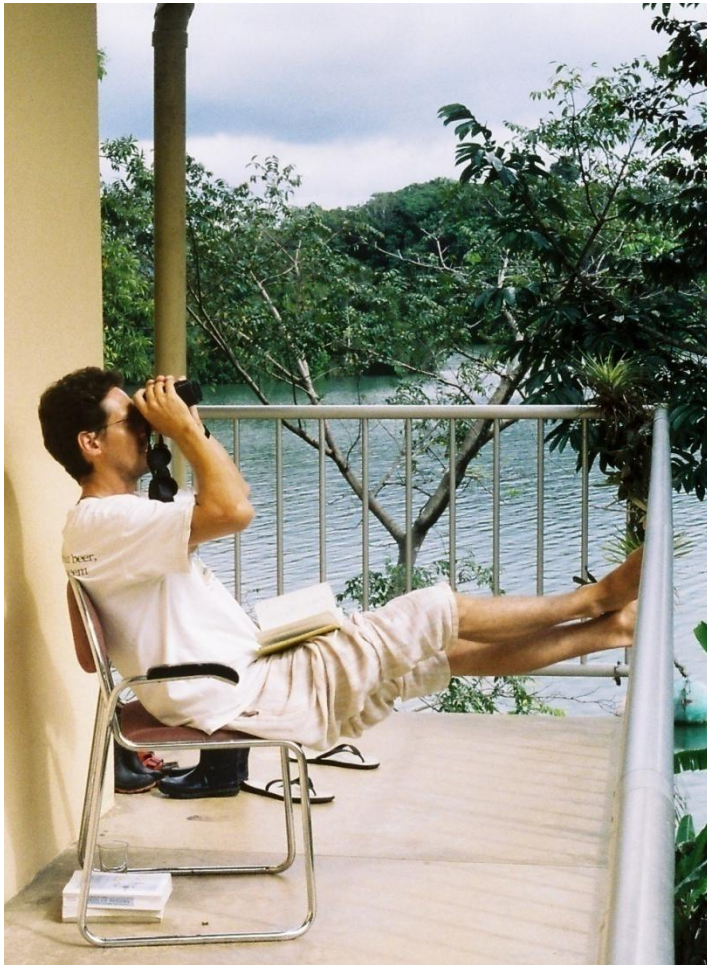
*Oryctanthus occidentalis*

**73%**

**20%**

**7%**


Watson 2012\*



\* *Biotropica* 45: 195–202

<b>Mistletoe species</b>	<b>Specialists</b>	<b>Generalists</b>	<b>Opportunists</b>	<b>Source</b>
<i>Oryctanthus occidentalis</i>	<b>73%</b>	<b>20%</b>	<b>7%</b>	Watson 2012*
<i>Cladocolea lenticellata</i>	<b>17%</b>	<b>83%</b>	<b>0</b>	Restrepo 1987
<i>Struthanthus oerstedii</i>	<b>60.0%</b>	<b>18%</b>	<b>22%</b>	Sargent 1994
<i>Oryctanthus spicatus</i>	<b>71%</b>	<b>14%</b>	<b>15%</b>	Sargent 1994
<i>Tapinanthus leendertziae</i>	<b>64%</b>	<b>15%</b>	<b>20%</b>	Godschalk 1983
<i>Tapinanthus natalitius*</i>	<b>80%</b>	<b>11%</b>	<b>9%</b>	Godschalk 1983
<i>Phoradendron robustissimum</i>	<b>60%</b>	<b>40%</b>	<b>0</b>	Sargent 1994
<i>Phoradendon chrysocladon</i>	<b>34%</b>	<b>66%</b>	<b>0</b>	Sargent 1994
<i>Phoradendron robaloense</i>	<b>21%</b>	<b>79%</b>	<b>0</b>	Sargent 1994
<i>Phoradendron corynarthrum</i>	<b>0</b>	<b>100%</b>	<b>0</b>	Sargent 1994
<i>Phoradendron colombianum</i>	<b>0</b>	<b>100%</b>	<b>0</b>	Restrepo 1987
<i>Phoradendron inaequidentatum</i>	<b>11%</b>	<b>89%</b>	<b>0</b>	Restrepo 1987
<i>Viscum combreticola</i>	<b>94%</b>	<b>5%</b>	<b>0.2%</b>	Godschalk 1983
<i>Viscum album</i>	<b>—</b>	<b>100%</b>	<b>0</b>	Snow & Snow 1988

\* *Biotropica* 45: 195–202

Mistletoe species	Specialists	Generalists	Opportunists	Source
<i>Oryctanthus occidentalis</i>	73%	20%		<p>Oecologia (2013) 172:925–932 DOI 10.1007/s00442-013-2693-9</p> <p>CONCEPTS, REVIEWS AND SYNTHESSES</p> <p><b>Mistletoe specialist frugivores: latterday ‘Johnny Appleseeds’ or self-serving market gardeners?</b></p> <p>David M. Watson · John Rawsthorne</p> <h1>Oecologia</h1> 
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<i>Viscum combreticola</i>	94%	5%		
<i>Viscum album</i>	—	100%		

# Oecologia

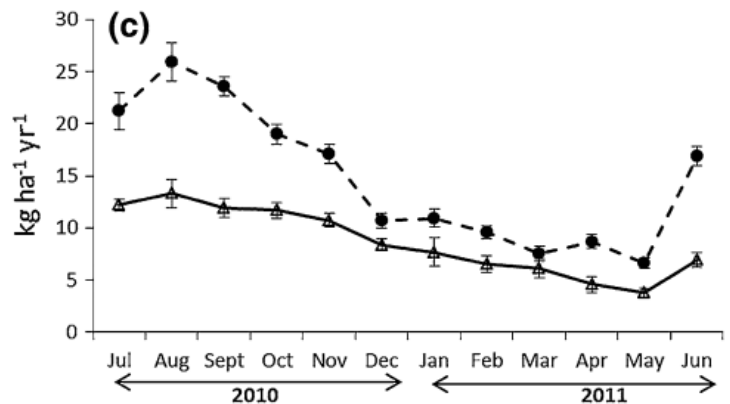
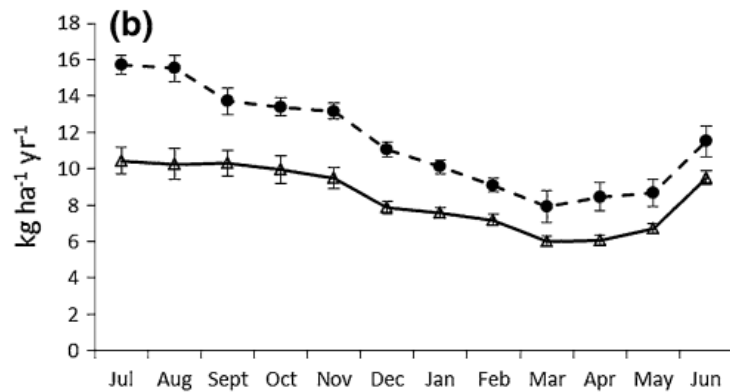
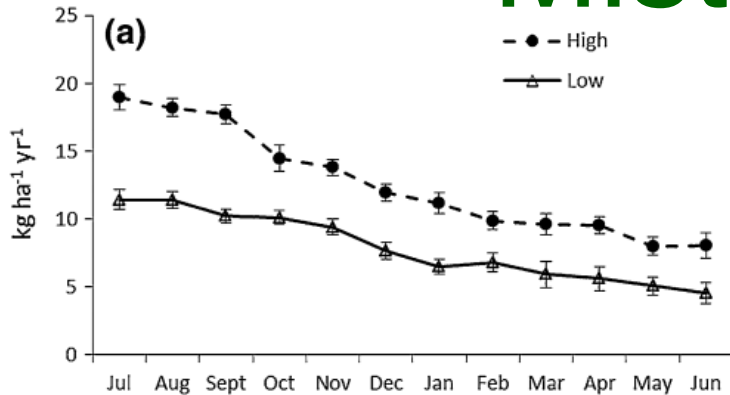


# Mistletoe litter

- Studies by Ndagurwa et al. in southern Zimbabwe
- Dry tropical forest
  - Acacia dominates canopy
  - Variable rainfall, poor soil
  - Herbivores
- Deeper litter beds noted beneath infected trees
- Accumulation of bird droppings also noted
- Series of litterbag experiments conducted



# Mistletoe litter



**Table 5** GLM of the effect of species (*E. ngamicum*, *P. kalachariensis*, *V. verrucosum*, and *A. karroo*, S), mistletoe density (High/Low, D), and their interaction on the nutrients of the surface soil (0–10 cm)

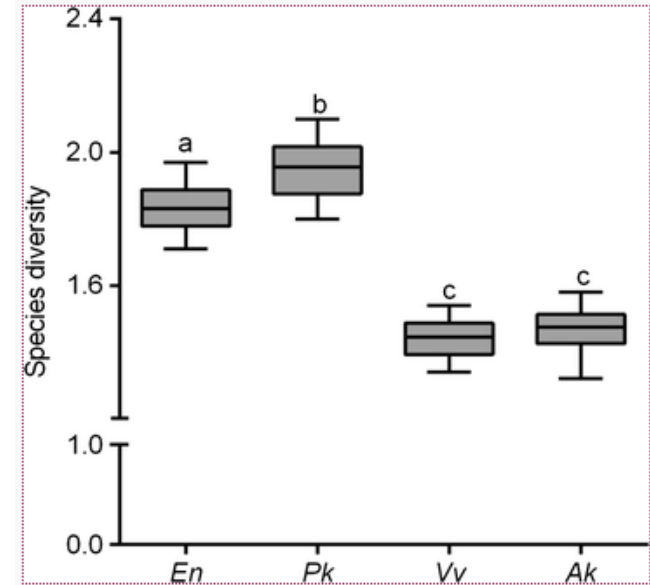
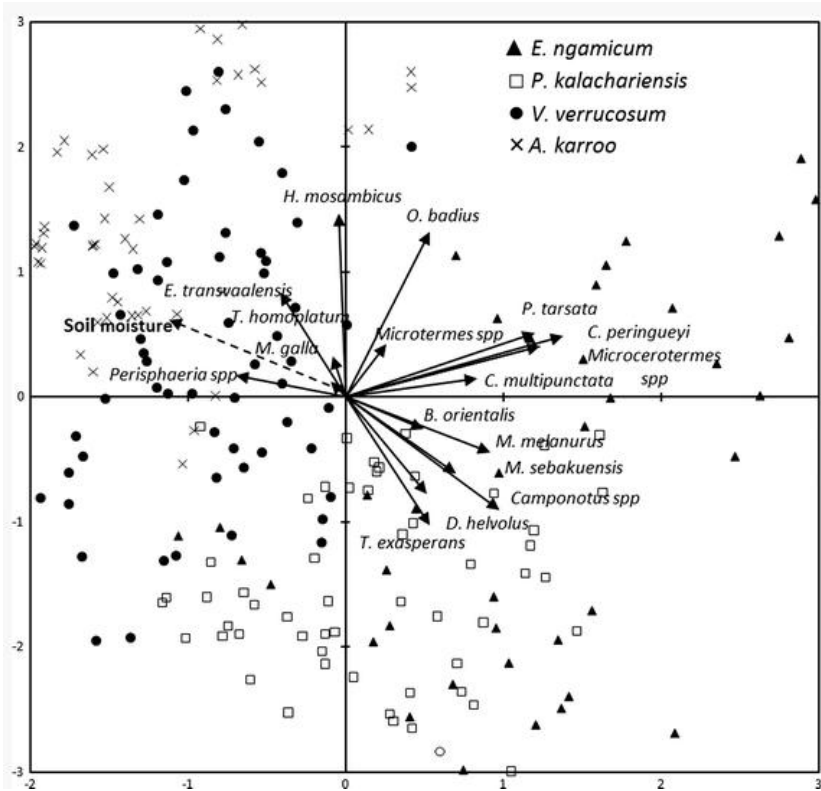
Parameters	Effects		
	Species (S)	Density (D)	S × D
pH	11.35**	54.94**	21.68***
N	3.97*	70.84**	13.44***
P	0.64*	579.61***	25.17***
K	2.17*	18.96**	1.92
Ca	13.16**	46.22**	24.38**
Mg	0.99*	40.75**	0.68

\*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$





# Mistletoe litter

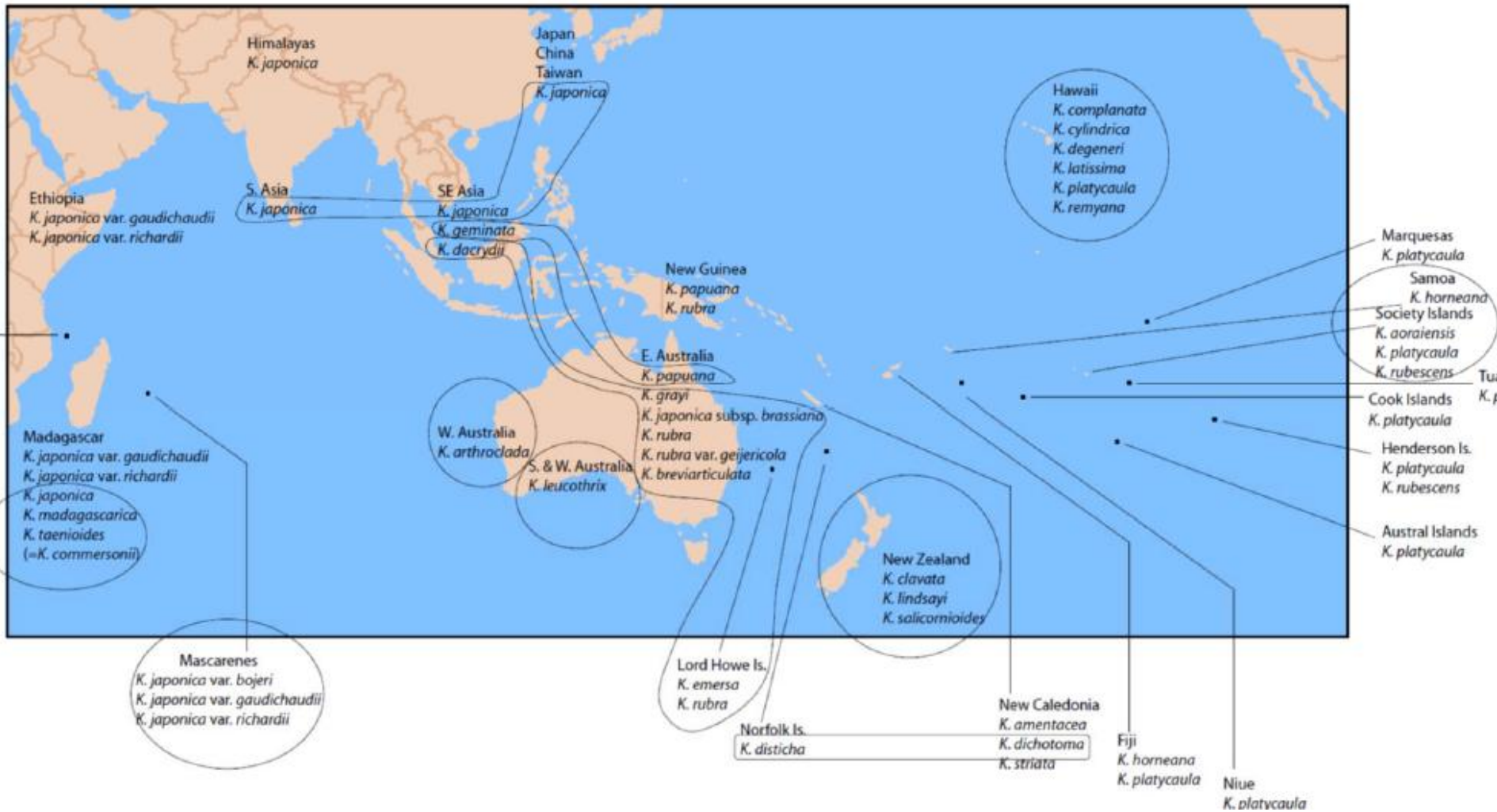


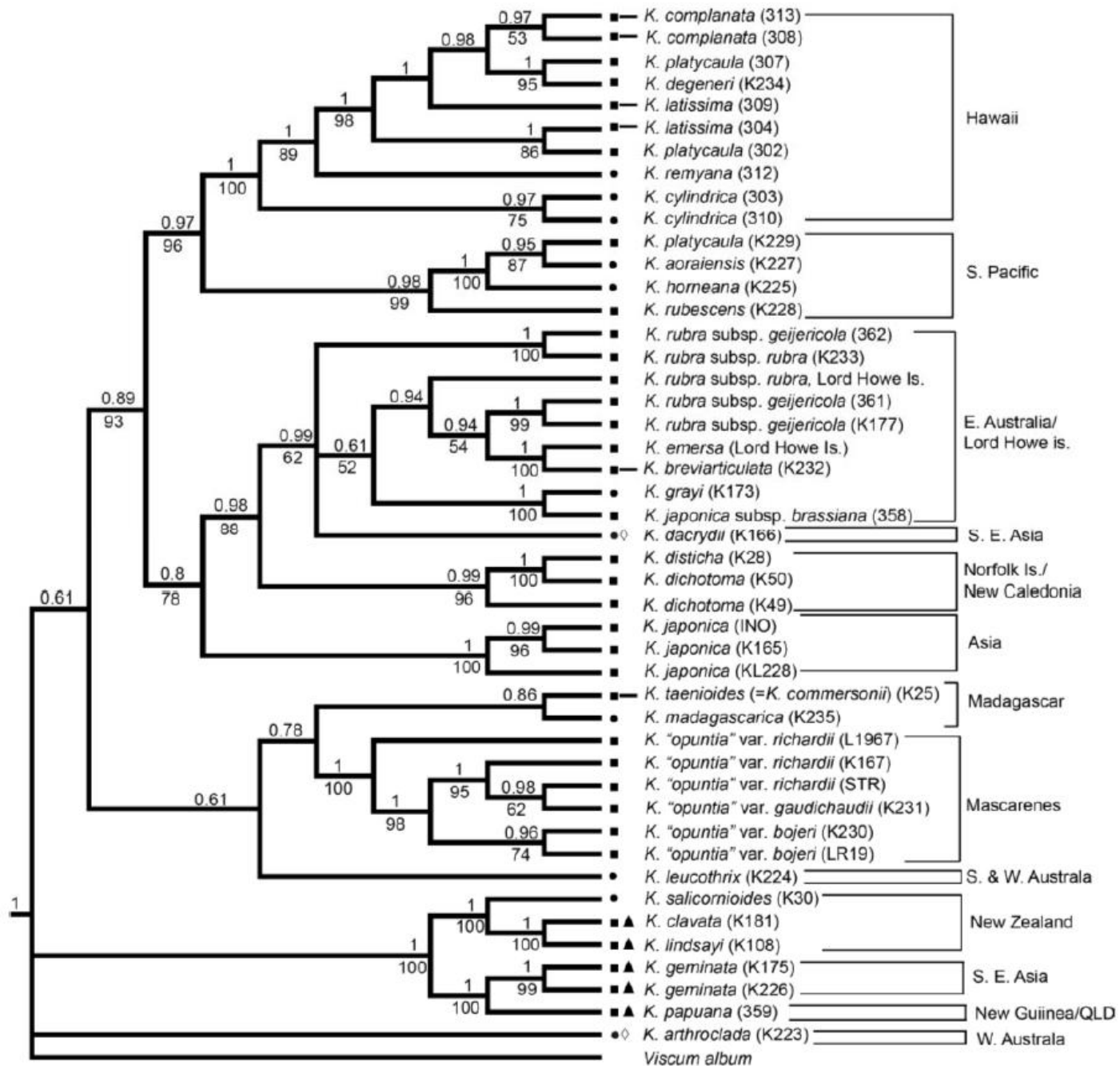
- Arthropod diversity 34% greater beneath infected *Acacia karroo* trees
- Majority spp litter-dependent

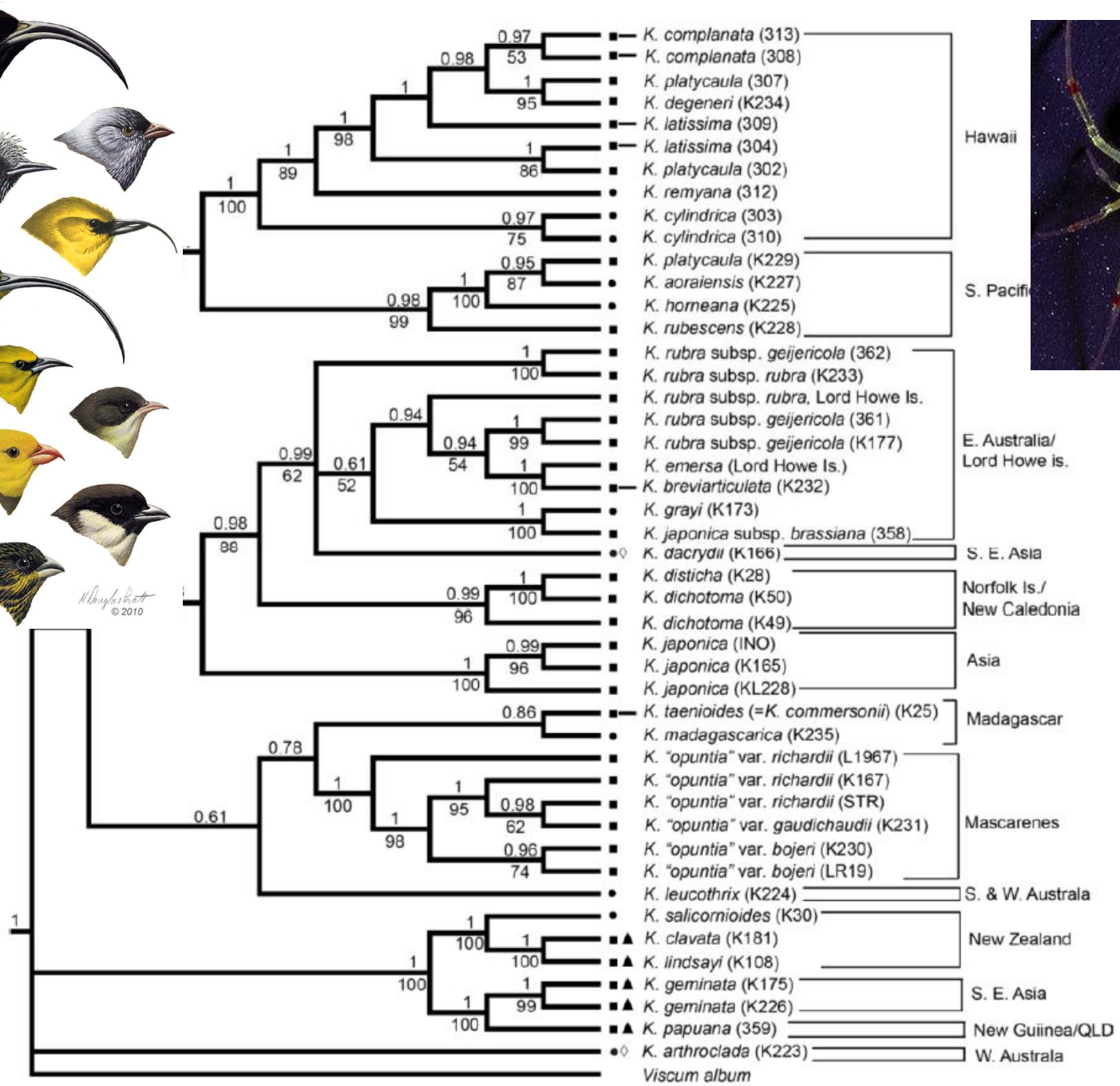


*Korthalsella cylindrica/remyana*  
Viscaceae  
© J. K. Obata











12c (Apr 2010)



12d (Jan 2011)



12a (Oct 2009)



12b (Apr 2010)

➤ Vegetative reproduction from endophytic tissue confirmed in *Korthalsella lindsayi*



<http://ecosystemunraveller.com>

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