

Nature's Hidden Economy

*Putting prices on services
we thought were free*



Conservation of Wild Pollinators for Agricultural Production in Africa

*Barbara Gemmill, University of Nairobi, Department of Botany and
Xerces Society for Invertebrate Conservation*















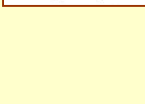
*Alfred Ochieng, University of Nairobi, Department of Botany and
International Centre of Insect Physiology and Ecology*

Dino Martins, Nature Kenya

Hannah Nadel, International Centre of Insect Physiology and Ecology

Pamela Rhys-Hurn, Environment Liaison Centre International

Some Horticultural Crops Grown in Africa Which May Require or Substantially Benefit from Animal Pollinators

Soybean		Cucumber	
Groundnut		Squash, marrow	
Beans (some)	 	Eggplant	
Cowpea		Cabbage	
Sunflower		Onion	 
Melon		Chili pepper	 

bee *thrip* *fly*



Some Tree Crops Grown in Africa Which May Require or Substantially Benefit from Animal Pollinators

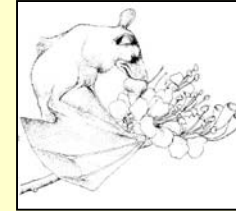
Oil palm



Fig



Avocado



Cocoa



Coffee



Mango



Karite nut



Citrus



Coconut



Papaya



beetle

wasp

moth

bee

fly

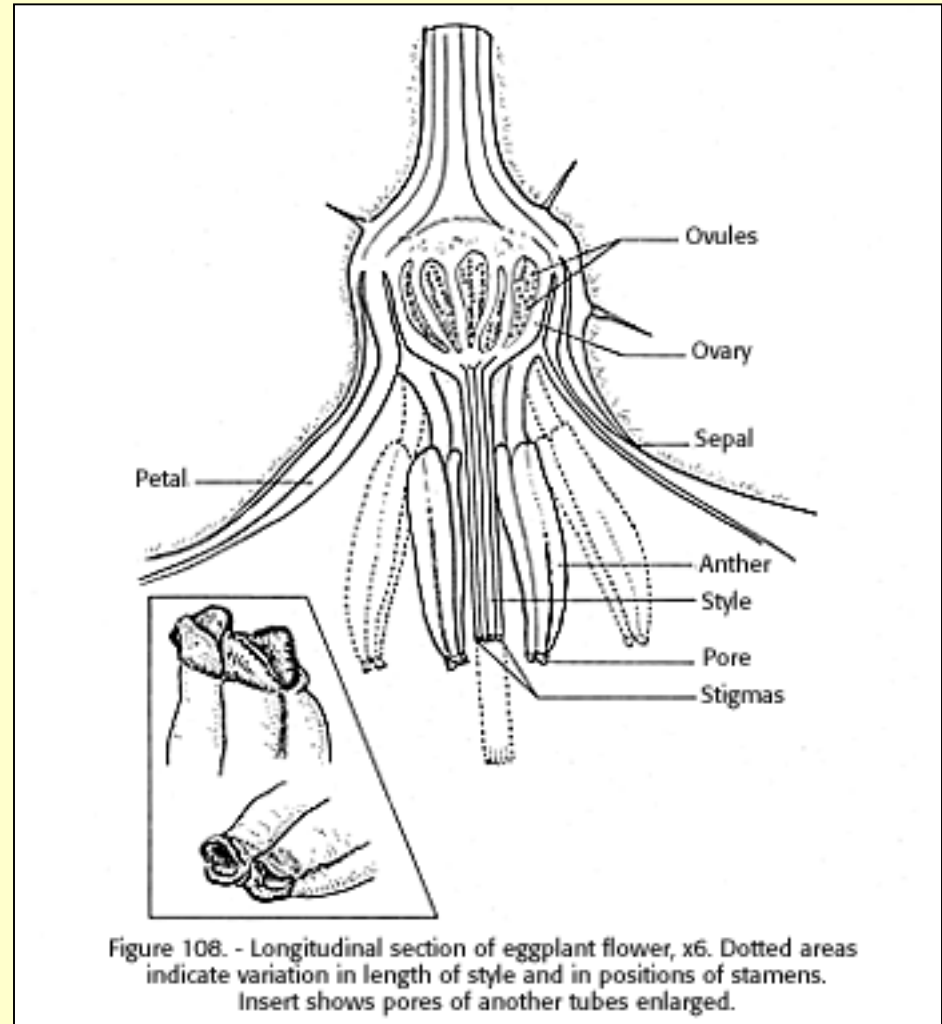
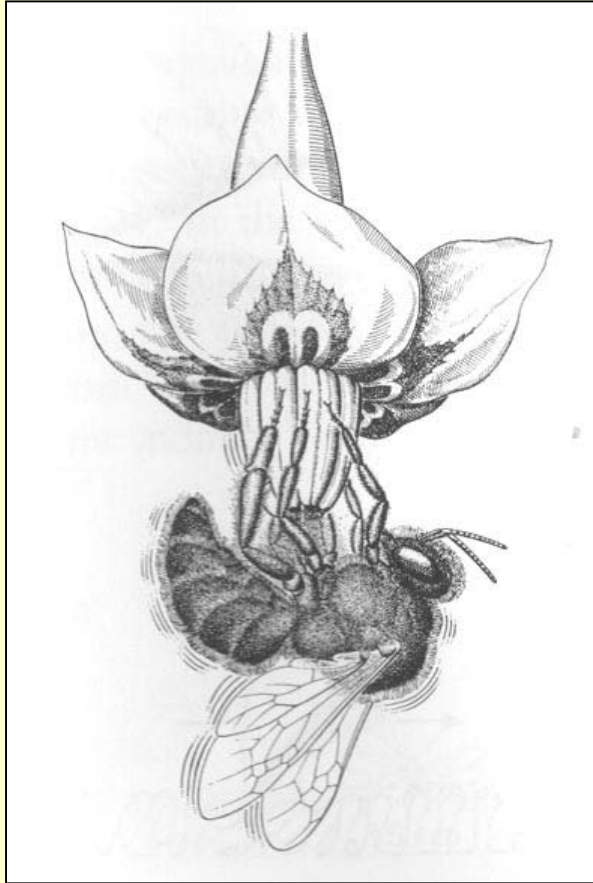
bat

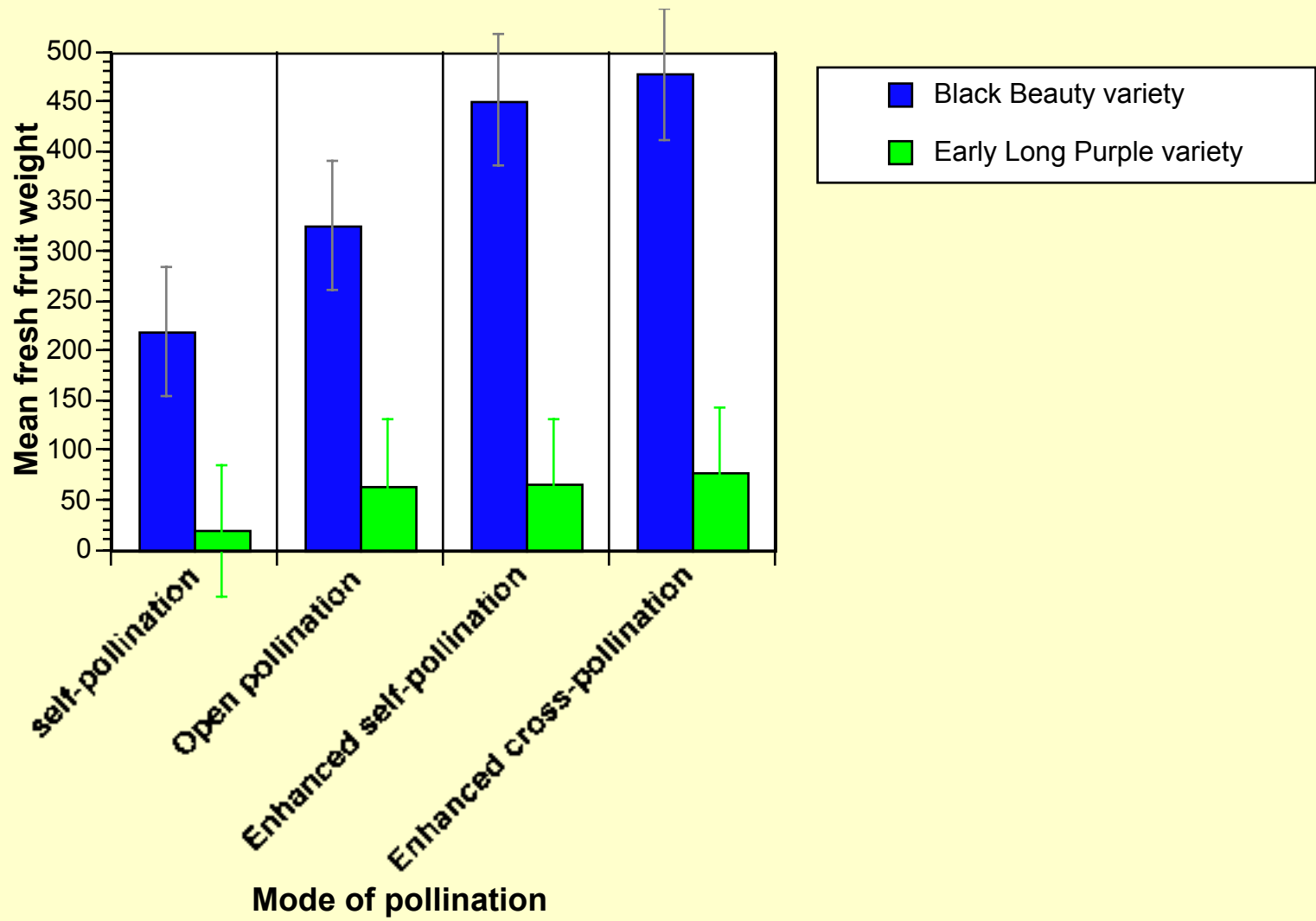


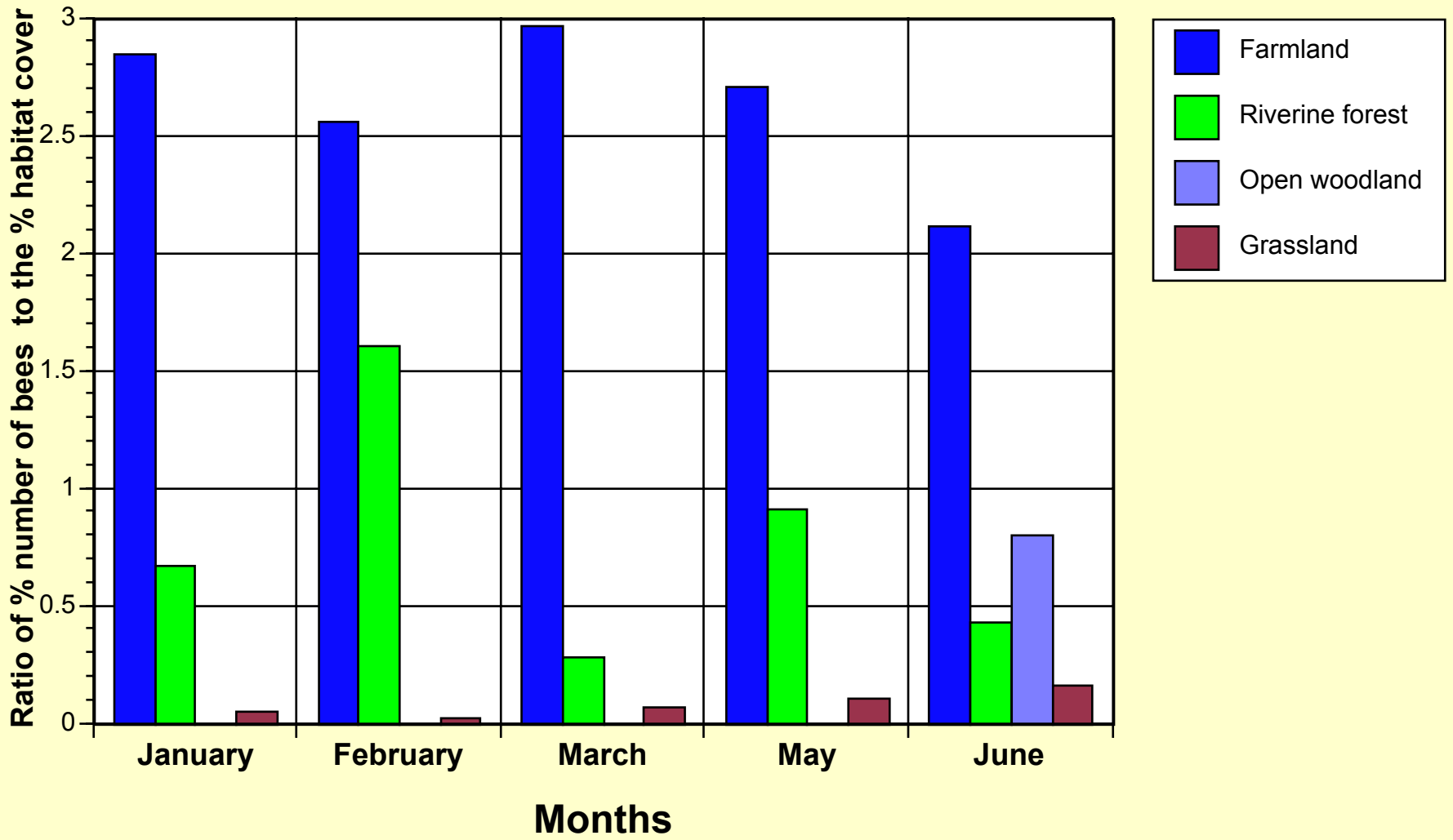
Estimated value of pollinator services

	FAO Production Year book Commodity "International Dollar" Price per ton	Annual Value World Production 1000s of "International Dollars"	Southwick's % Crop Loss with No Replacement Pollinators	Value of Losses 1000s of "International Dollars"
TROPICAL TREE CROPS				
MANGOES (% From J. B. Free)	211.49	4,715,496	50%	2,357,748
COFFEE, GREEN (% from J. B. Free)	958.96	5,286,733	50%	2,643,367
COCOA BEANS (% from J. B. Free)	663.10	1,956,085	50%	978,042
PALM OIL (% from J. B. Free)	165.05	2,629,554	20%	525,911
	Sub-total	14,587,867	43%	6,505,067
VEGETABLE AND SEED CROPS				
ARTICHOKES	590.70	671,135	10%	67,114
ASPARAGUS	1440.85	5,607,111	21.87%	1,226,275
CABBAGES	100.24	4,502,052	0.63%	28,363
CARROTS	162.87	2,648,771	1.68%	44,499
CAULIFLOWER	183.92	2,333,767	3.87%	90,317
COTTONSEED	174.69	6,450,614	30%	1,935,184
CUCUMBERS AND GHERKINS	223.12	13,091,076	60%	7,854,646
SUNFLOWER SEED		292.45		7,771,635
	6,169,308			
	Sub-total	43,076,161	26%	17,415,706

Buzz Pollination in the Solanaceae



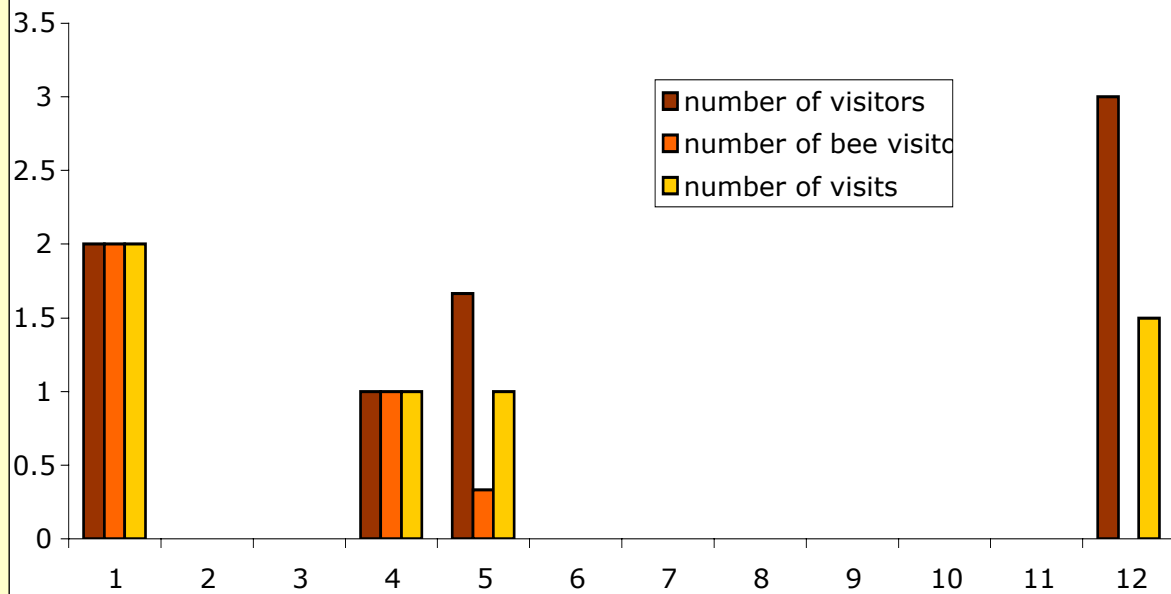
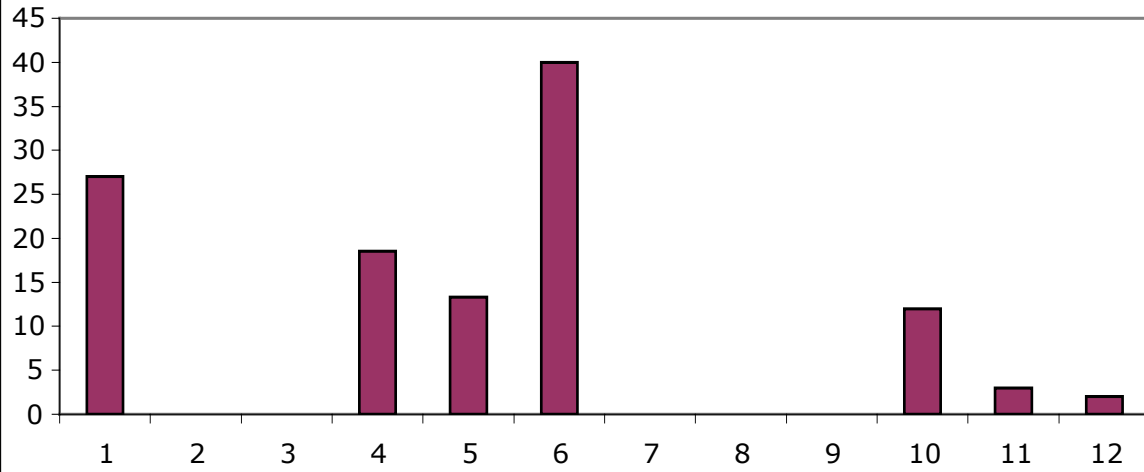




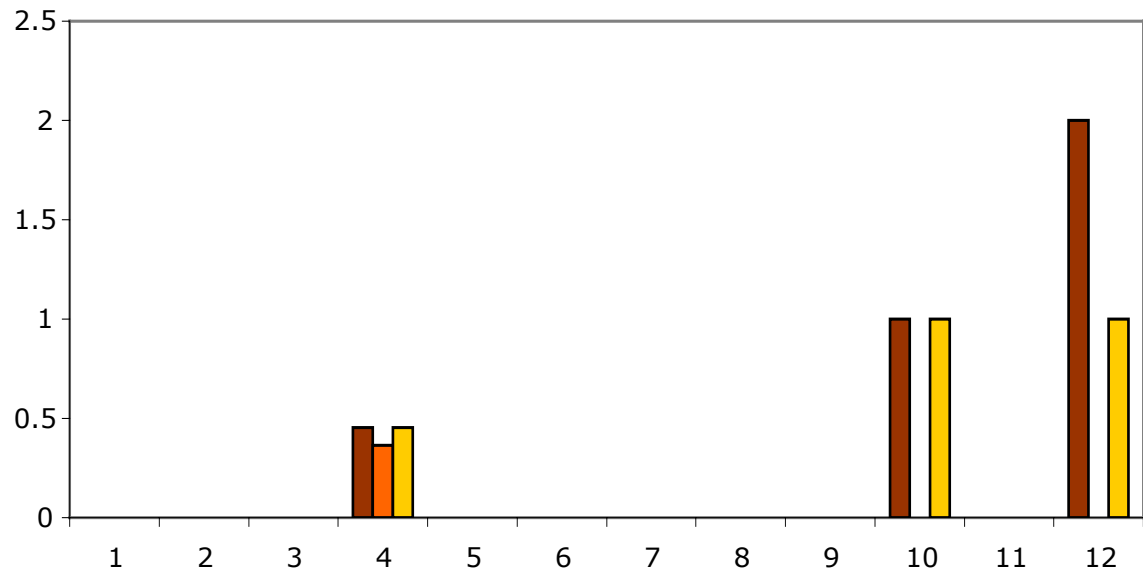
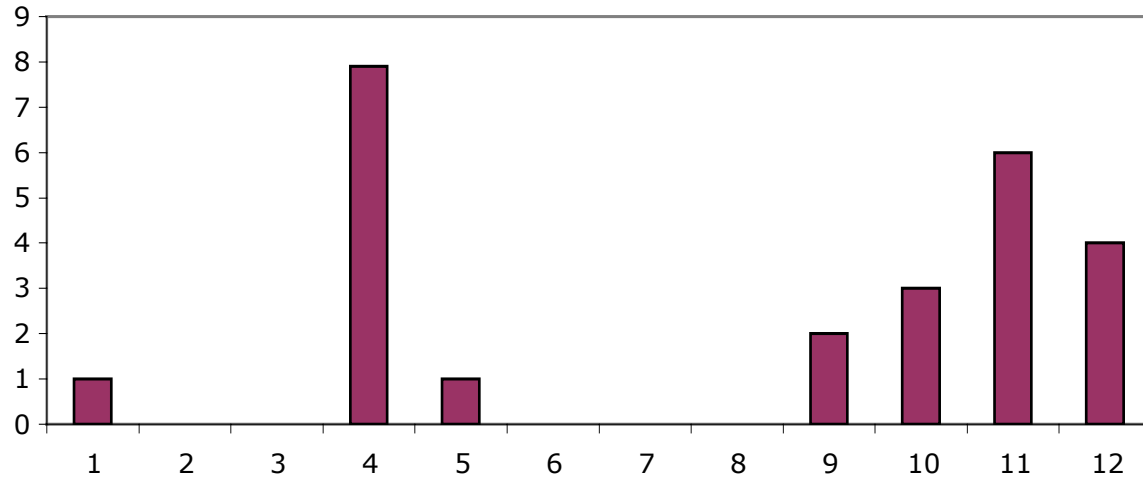


Riverine Acacia woodland of Nguruman

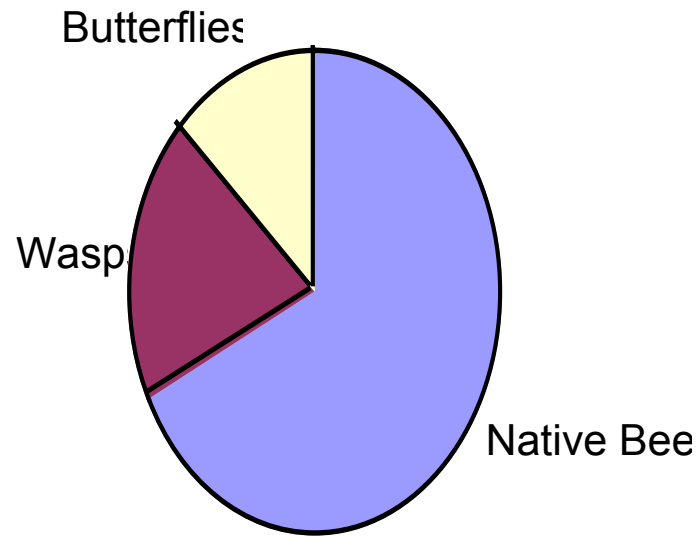
Acacia nilotica number of flowers/1



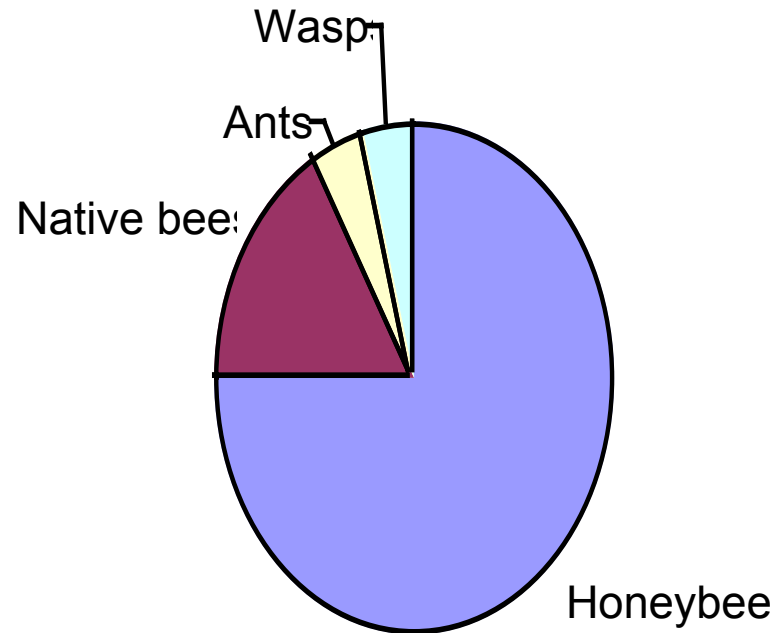
***Barleria spinesepala* number of flowers/1**



Diversity of Floral Visitors on *Acacia seneg*



Floral Visitors to Aloe spp. (6.00-9.00a.m.)



**Floral Visitors to Aloe spp. (9.00 - 11.00
a.m.)**

