What Have Plants Ever Done for Us?

Created Environments,

Biodiversity and Science -

How do we resolve perceived conflicts in the realisation of a more beautiful world?

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Current Interests and work

Forensic botanist

Flora of Greater London

Mycology, especially oomycetes and field mycology

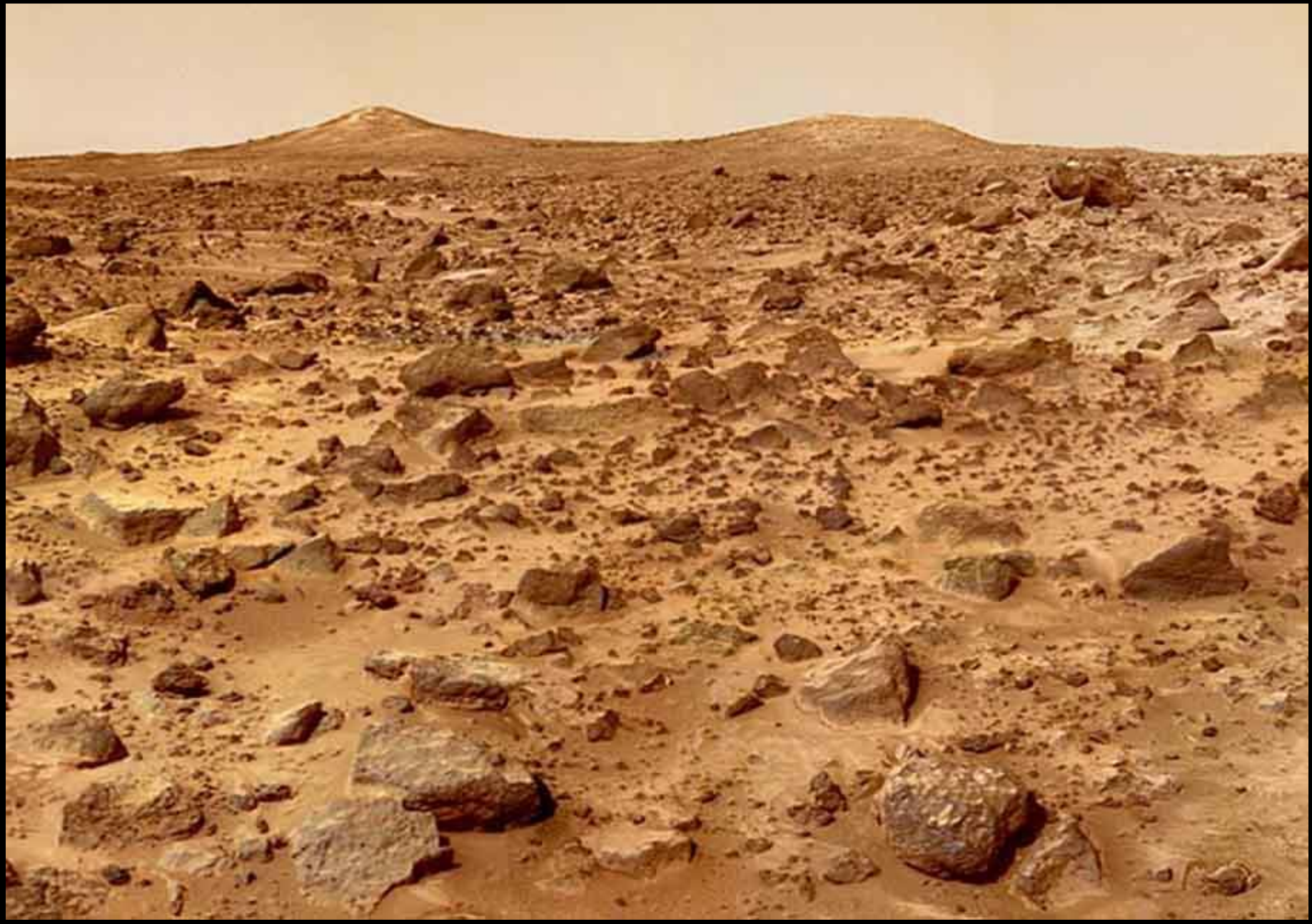
17th and 18th century botanic gardens

Plant nomenclature and Linnaeus

Invasive species and biocontrol

Environmental change

Lectotype of *Geranium cucullatum* L. (*Pelargonium cucullatum* subsp. *strigifolium* Volschenk)



Mars

Biodiversity – The sum total of our dependence upon and experience of the living world, that which sustains and enriches our lives

Vellan Head & Gew-graze, Lizard Peninsula, Cornwall

The Anthropocene and ‘Pangaeafication’

The Eden Project, Cornwall and a map of Pangaea (300-175 mya)

Landscape and environment, and therefore plants, are the bedrock of human cultural identity.

Cyperus involucratus, Quercus robur and *Acanthus mollis.*

Landscape and environment, and therefore plants, are the bedrock of human food, medicine……..

Agaricus augustus, *Ulmus procera*, *Fucus spiralis* and *Crambe maritima*.

Biodiversity and human well-being

London Natural History Society, botany group recording London's flora by Three Mills on the lower River Lea

Created Landscape – Scope of this talk

Camley Street Natural Park, Camden, London

Created Landscape – landscape continuity and biodiversity

Ranscombe Farm, Kent

All actions have consequences

Chilterns woodland with *Fagus sylvatica*, *Hyacinthoides non-scripta*, *Euphorbia amygdaloides* & *Lamiastrum galeobdolon*

More consequences – stinking iris, *Iris foetidissima* c.v.s

More consequences – *Phormium tenax* invading dunes on the Isles of Scilly

Environmental Change – complexity = resilience

Hampton Court Palace

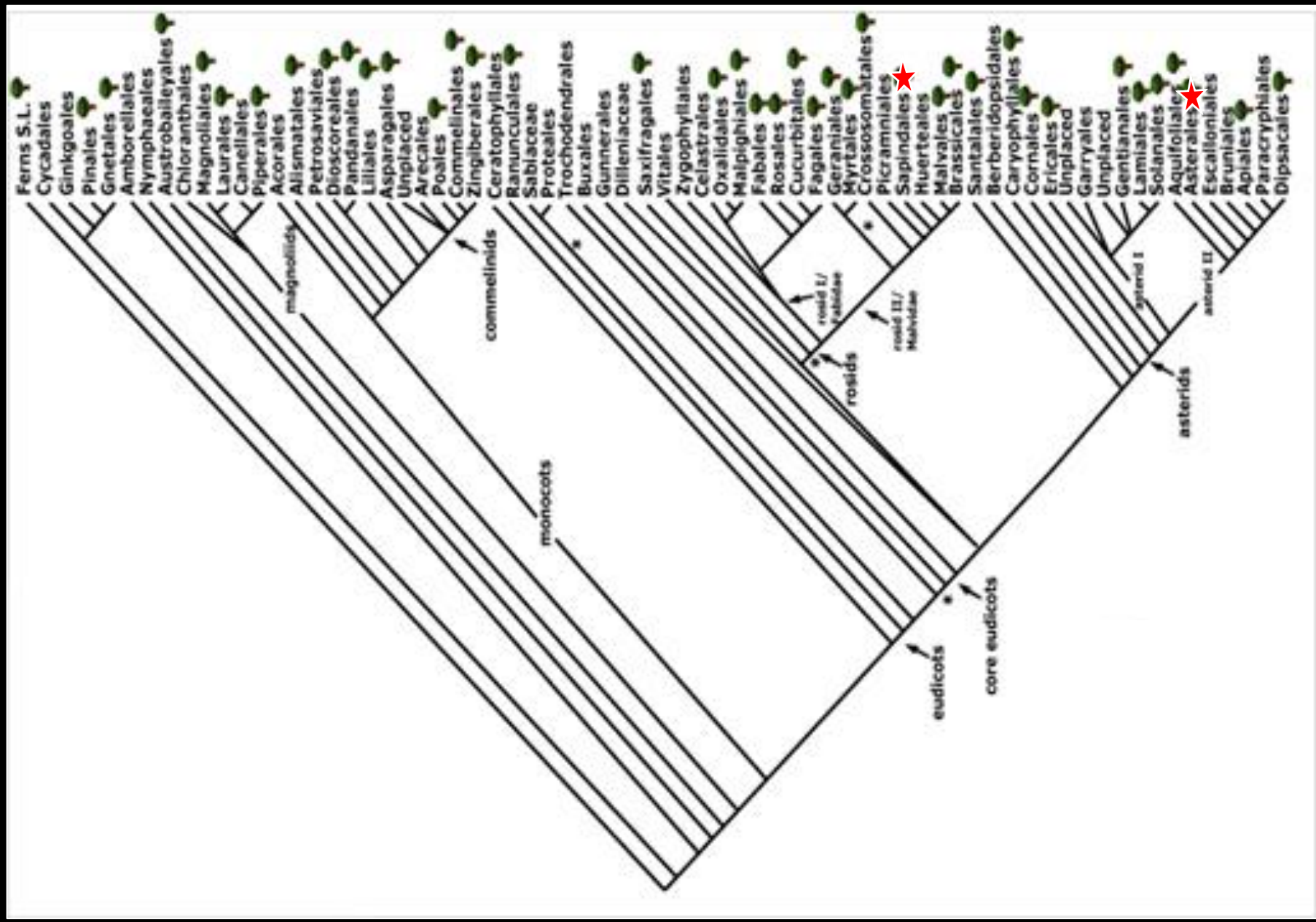
Aesthetics and Biodiversity

Problematically, desirable outcomes, such as 'wild-life friendliness', 'sustainability', 'adaptation and mitigation', that are required when creating aesthetically pleasing places are not all necessarily entirely realisable.

Syrphid hoverfly feeding on *Succisa pratensis*

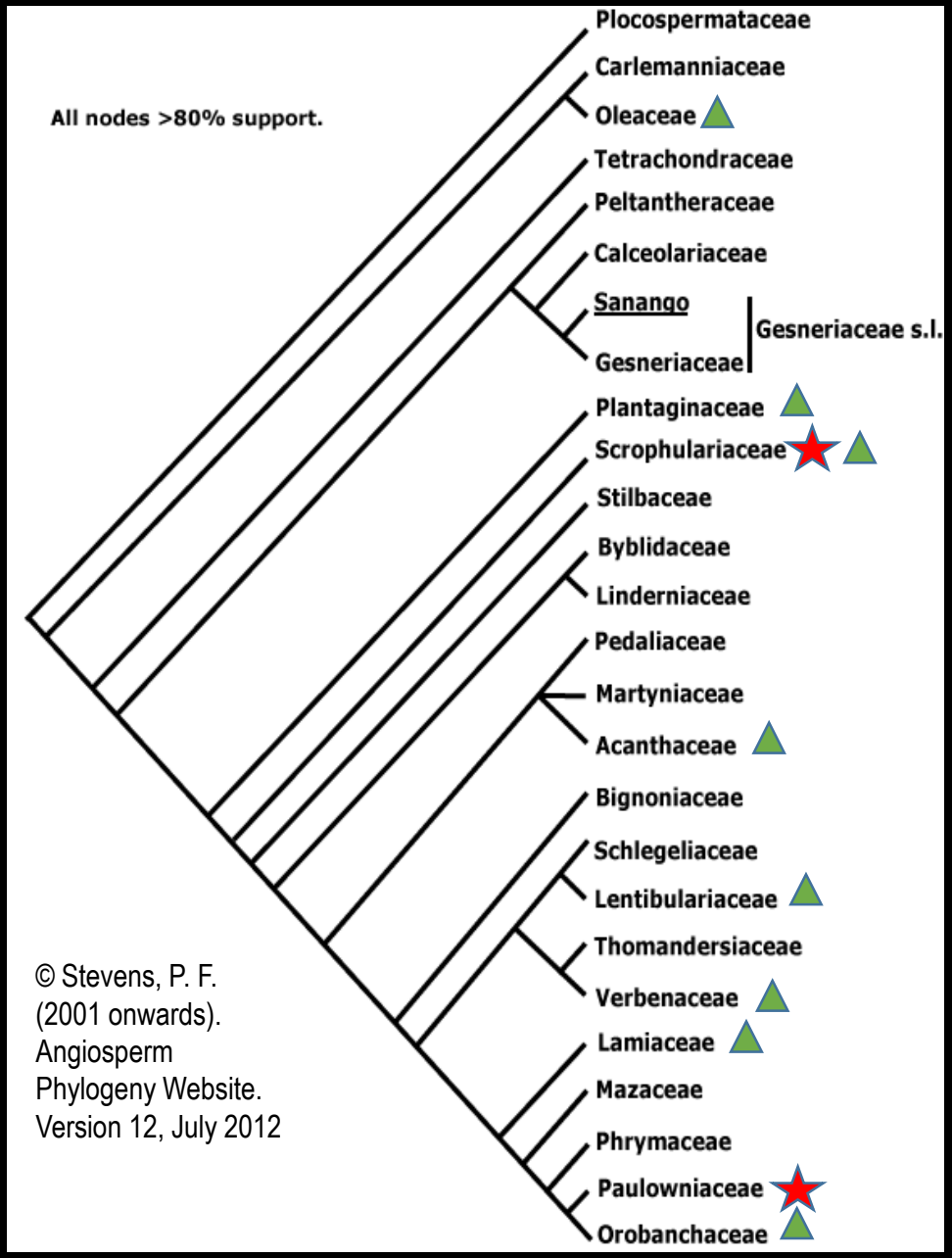
Hedychium c.v., *Prunus spinosa* and *Cotoneaster rehderi.*

A biocontrol perspective, the centrifugal phylogenetic method



BIOCONTROL - centrifugal phylogenetic method, a hypothetical example

Buddleja davidii, Scrophulariaceae, Lamiales



Centrifugal phylogenetic method – other considerations: habitat/ecology and conservation status

Within Lamiales and Scropulariaceae

Verbascum and *Scrophularia*
Limosella
Diascia and *Nemesia*

Within Lamiales

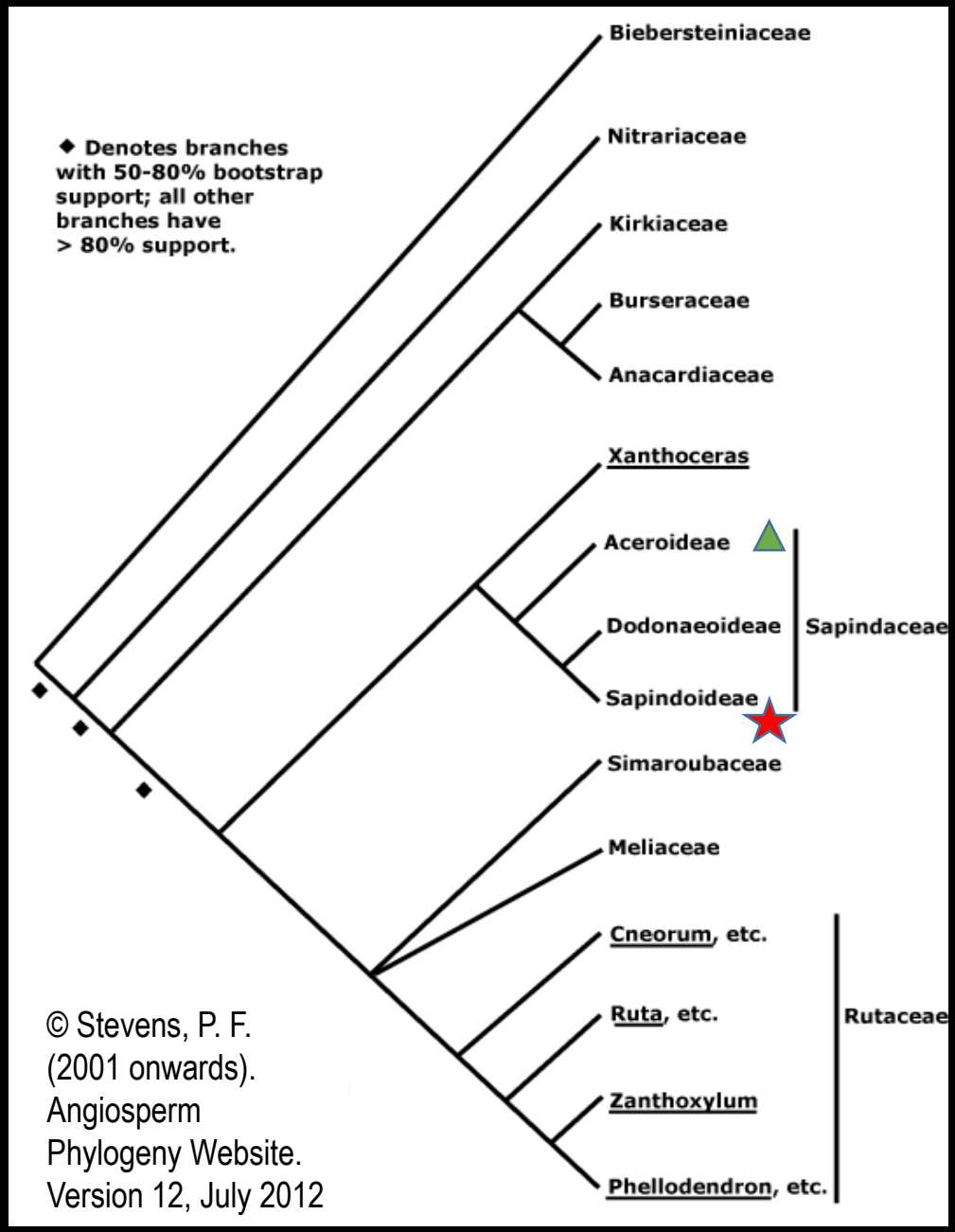
Acanthus
Campsis and *Catalpa*
Utricularia and *Pinguicula*
Verbena
Ajuga, Chlerodendrum and *Teucrium*
Salvia, Thymus, Origanum and *Nepeta*
Scutellaria
Stachys and *Phlomis,*
Mazus and *Mimulus*
Paulownia
Orobanche, Rhinanthus, Euphrasia and *Pedicularis*

Olea, Ligustrum, Fraxinus and *Jasminium*
Calceolaria
Plantago, Digitalis, Veronica, Penstemon and *Antirrhinum*

Digitalis canariensis.

Predicting Biological Invasion - *Ailanthus-altissima* (tree-of-heaven)

Evolutionary relationships with the Order Sapindales



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Bieberstenia odora
Middle East, Central Asia & China

Peganum harmala
Middle East & South Asia – Invasive in USA

Kirkia wilmsii
South & East Africa

Bursera simaruba
Central & South America

Anacardium occidentale
Brazil – Now widely cultivated

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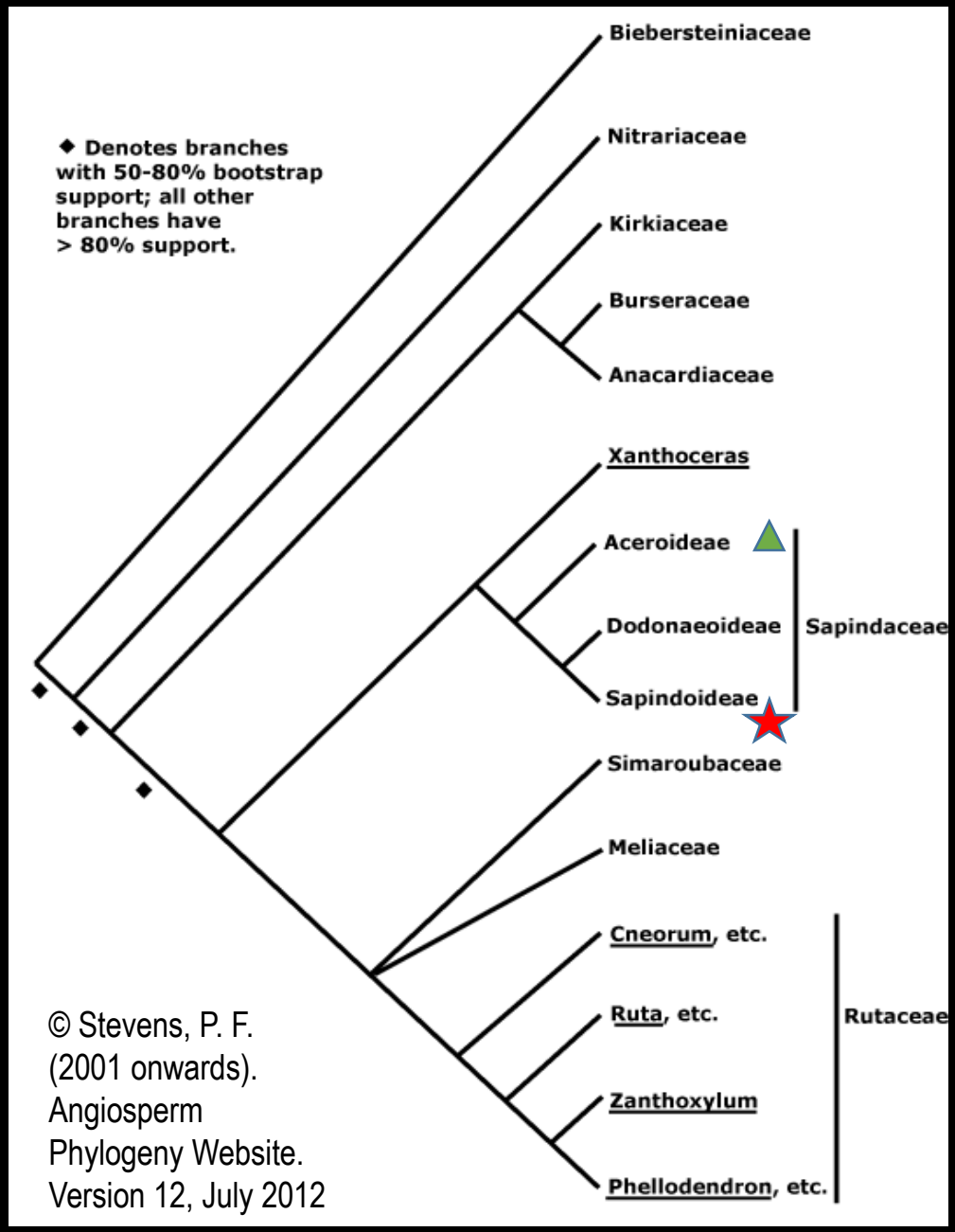
Evolutionary relationships with the Order Sapindales



Xanthoceras sorbifolia
Northern China

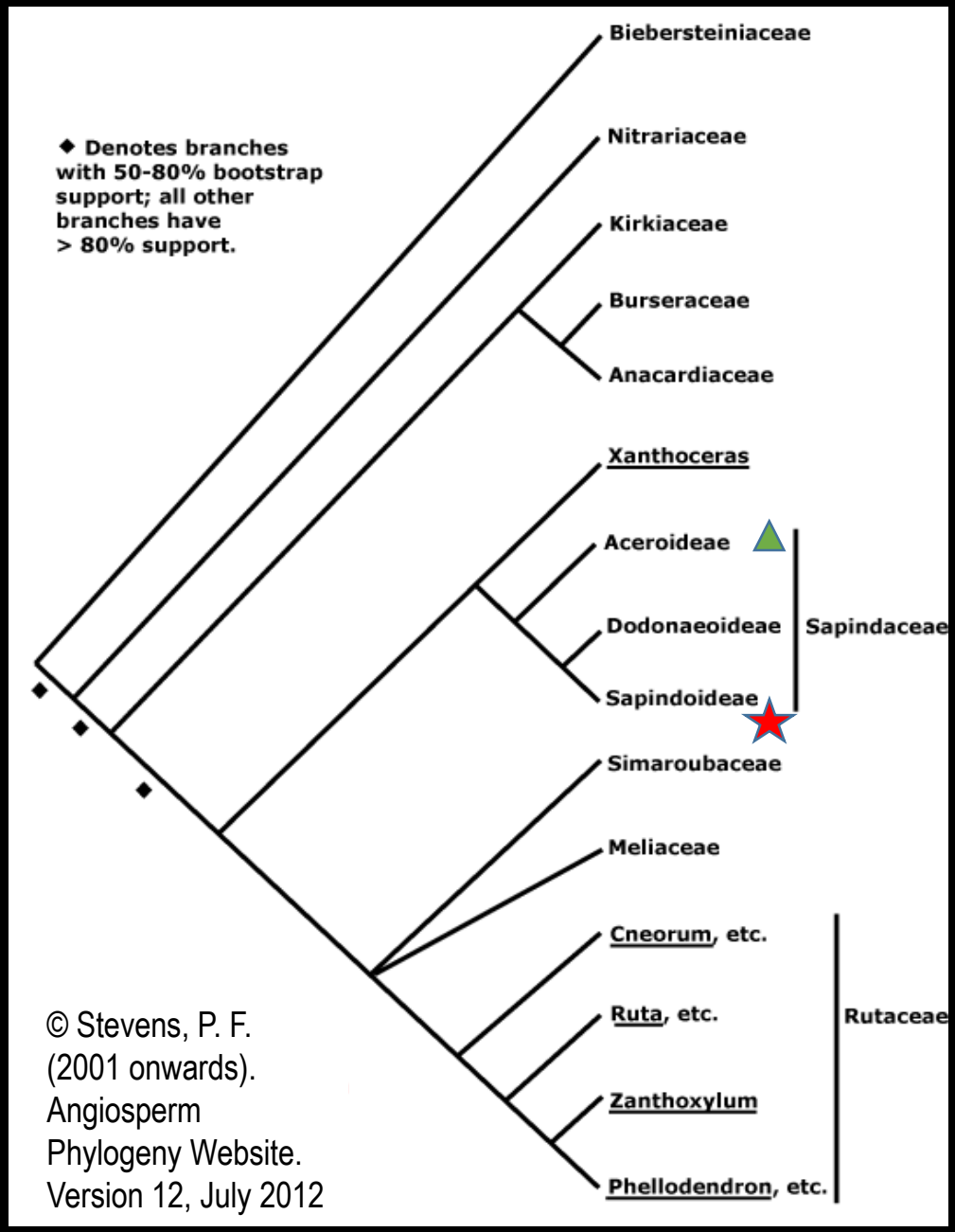
Acer plantanoides
Europe – Naturalised in Great Britain & Ireland

Dodonaea microzyga
Australia

Koelreuteria paniculata
East Asia – Invasive in USA

Source Wikimedia Commons, except *A. platanoides*

Evolutionary relationships with the Order Sapindales



Simarouba tulae
Caribbaean

Melia azedarach
South-East Asia & Australasia – Invasive in USA

Ruta graveolens
Mediterranean

Poncirus trifoliata
Northern China & Korea

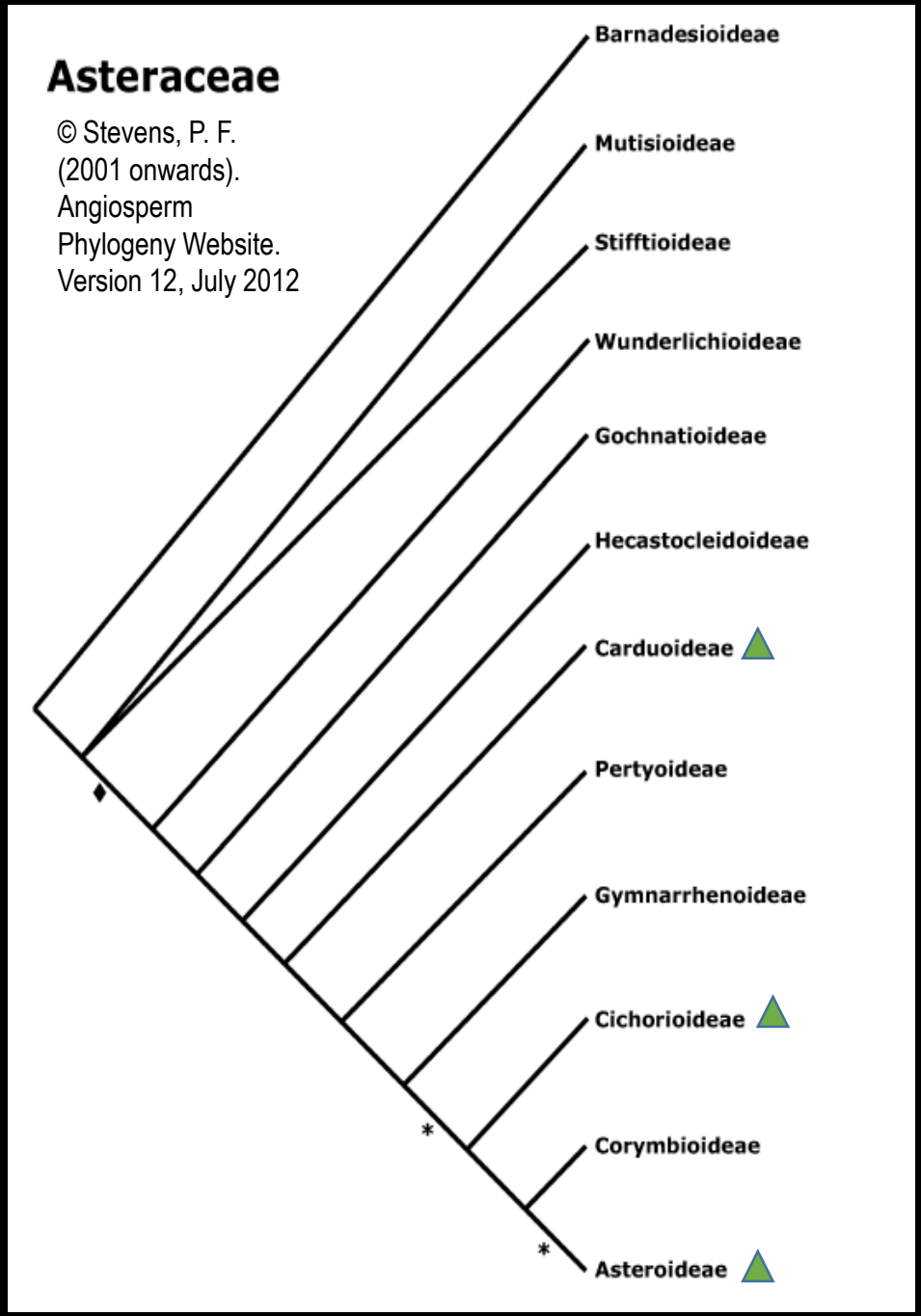
Phellodendron amurense
East Asia – Invasive in USA

Source Wikimedia Commons, except *P. trifoliata*

Paulownia tomentosa, **foxglove-tree**

Plants and their Pollinators - Oligolectic bees - ivy bee *Colletes hederae* and common ivy, *Hedera helix*

Pollinators and Asteraceae – South American origins



Mutisia decurrens

Gazania rigens, Osteospermum jucundum and *Olearia macrodonta.*

Echinacea purpurea, Symphyotrichum x *salignum* and *Helianthus* x *laetiflorus.*

Galinsoga quadriradiata, Solidago canadensis and *Erigeron karvinskianus.*

Echinops bannaticus, Eupatorium cannabinum, Onopordon acanthicum, *Leucanthemum vulgare* & *Pulicaria dysenterica*.

"Pollinators of Asteraceae might seem not to be very selective, since the frequent and diverse insect visitors so obvious on a capitulum of any size trample around on top and appear to pollinate indiscriminately as they go, but this may not be quite true.

Effective pollination is commonly carried out by a variety of broadly oligolectic small and often solitary bees belonging to Andrenidae and Colletidae. These form complex and partly learned associations with individual species of Asteraceae".

‘British and Irish wild plants are poor garden/landscape plants’

Taraxacum officinale agg. Northamptonshire countryside

Centaurea scabiosa, Helianthemum nummularium, Campanula glomerata and Tamus communis

Euphorbia amygdaloides, Erica cinerea, Lotus corniculatus and Primula vulgaris

And a potential solution - ‘near-natives’



Lathyrus tuberosus, Medicago sativa ssp. *varia and Vicia villosa*