

Oxalis corniculata group: around the world and back again

Quentin J. Groom, Ivan Hoste & Steven Janssens

Botanic Garden Meise, Bouchout Domain, Nieuwelaan 38, 1860 Meise, Belgium

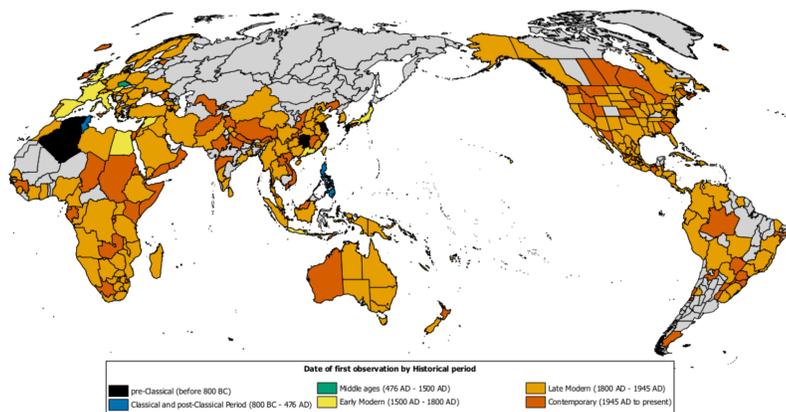
orcid.org/0000-0002-0596-5376

Twitter: @cabbageleek



Where is *Oxalis corniculata* native?

- * The earliest records of *Oxalis corniculata* taken from herbarium specimens, observations, published floras and archaeological remains. The first records are divided into six periods of human history.



- * The earliest records of *Oxalis corniculata* are from preserved seeds in archaeological remains. The earliest of these are from the Majiabang culture (7000–5800 BP) and Daxi culture (7000–5300 BP) in Neolithic China (Nasu et al. 2012; Qiu et al. 2016). Also, in Japan seeds have been found from the Early Yayoi period (ca. 2820–2530 BP) and in the Philippines in the 1st millennium BC (Barakat 1995; Paz 2005). These remains fix *Oxalis corniculata* as native to East and Southeast Asia. However, there is also a report from the Hoggar Mountains in southern Algeria from Hyrax middens from the Late Neolithic (Barakat 1995) and although this single report might be viewed skeptically, a much later record (2700 BP) from Ancient Carthage in modern day Tunisia also exists (van Zeist et al. 2001). These observations and the evolution of the section suggest that *O. corniculata* migrated from eastern Asia

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1 Introduction

Introduction

Oxalis corniculata is a ubiquitous weed, probably present in every country in the world. In recent years it has become a serious weed of the horticultural industry, infesting pot plants and spreading through the international horticultural network. In addition, there are at least three other invasive species in *Oxalis* section *corniculatae*. These are *O. stricta* and *O. dillenii*, from North America, and *O. exilis*, from Australasia. All these four species have naturalized in Europe and elsewhere.

2 The Problem

The Problem

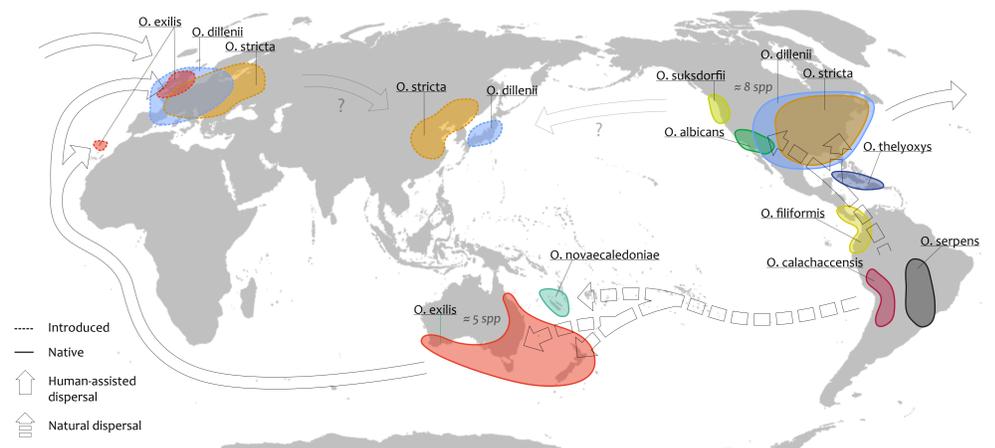
Where did *Oxalis corniculata* originate, how did it evolve and why has it become such a successful invader?

3 The Approach

The Approach

Using a historical and phylogenetic approach we have studied the biogeography of *Oxalis* section *corniculatae* to better understand the reasons for its success.

The natural and anthropogenic dispersal of species in *Oxalis* section *corniculatae*: A working hypothesis



- * North American species: *Oxalis* section *corniculatae* evolved in South America and migrated naturally to North America. In North America it diverged into several species, including *O. stricta*, *O. dillenii*, *O. grandis* and *O. suksdorfii*. In the 18th century, or earlier, *O. stricta* was introduced to Europe, presumably accidentally by humans. *O. dillenii* was introduced to Europe and elsewhere in the 19th century and is still spreading.
- * Australasian species: *Oxalis* section *corniculatae* arrived in Australasia naturally across the Pacific and diverged into many species, including *O. novaealedoniae*, *O. chnoodes*, *O. exilis*, *O. perennans* and *O. rubens*. Only *O. exilis* has successfully naturalized elsewhere, being widespread in the United Kingdom, where it has been spread by the horticultural industry and has escaped cultivation. Recently, it has been found on the European mainland (Hoste 2014).



O. corniculata

O. stricta

O. exilis

O. corniculata
var. *atropurpurea*