



## Revision of five species of *Euonymus* (Celastraceae) from East and South Asia

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### Abstract

Based on re-collections at known sites, field observations, study of specimens and review of literature, taxonomic revisions of five *Euonymus* species from East and South Asia are presented, including three new synonyms of *Euonymus laxiflorus* Champion ex Benth, a new synonym of *Euonymus mengtzeanus* (Loesener) Sprague, a new synonym of *Euonymus gracillimus* Hemsley, and supplemental descriptions of the floral features of *Euonymus pittosporoides* Cheng ex Ma and *Euonymus ficoides* Cheng ex Ma. Lectotypes are also designated for seven names wherein the holotype had not been designated in the original publication. Additionally, the conservation status of these species is reevaluated according to IUCN standards (version 3.1).

**Key words:** *Euonymus*, taxonomic revision, typification, conservation status, east and south Asia

### Introduction

*Euonymus* Linnaeus (1753: 197) is one of the largest genera of Celastraceae, with about 130 species (Ma 2001) to 176 species (Blakelock 1951) worldwide. Five sections are currently recognized based on fruit characters, and most of them are mainly from east and southern Asia (Cheng & Huang 1999, Ma 2001, Ma & Funston 2008). *Euonymus* species are rare taxa in the community, and exhibit neither showy flowers nor visually conspicuous fruits; therefore, specimen collections of *Euonymus* in the herbaria are few and usually poor in quality. Many fruiting specimens failed to be matched with those of flowers because of the time interval between flowering and fruiting, and the morphological traits of the capsule are considered to be a key diagnostic features for species identification. Specimens misidentified as other taxa or repeatedly published as new taxa are both major taxonomic problems in the genus. Thus, it has become necessary to revise the taxonomic treatment and reevaluate the position of certain problematic taxa.

As a continuation of our revision of three species of *Euonymus* (Celastraceae) from China (Du et al. 2013), taxonomic revisions of five *Euonymus* species from East and South Asia are provided here, including three new synonyms of *Euonymus laxiflorus* Champion ex Benth (1851: 333), a new synonym of *Euonymus mengtzeanus* (Loesener) Sprague (1908: 35), a new synonym of *Euonymus gracillimus* Hemsley (1886: 119), and supplemental descriptions of floral features of *Euonymus pittosporoides* Cheng ex Ma (1998: 232) and *Euonymus ficoides* Cheng ex Ma (1997: 94). Furthermore, we designate the lectotypes for seven names wherein the holotype had not been selected in the original materials. The distribution areas of these species are identified through intensive study of specimens in major herbaria. Moreover, the conservation status of these species are reassessed according to the standards of IUCN (version 3.1, IUCN, 2012).