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Oxalidaceae R.Br.

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Australian Government
Department of the Environment and Energy

Australian Biological Resources Study

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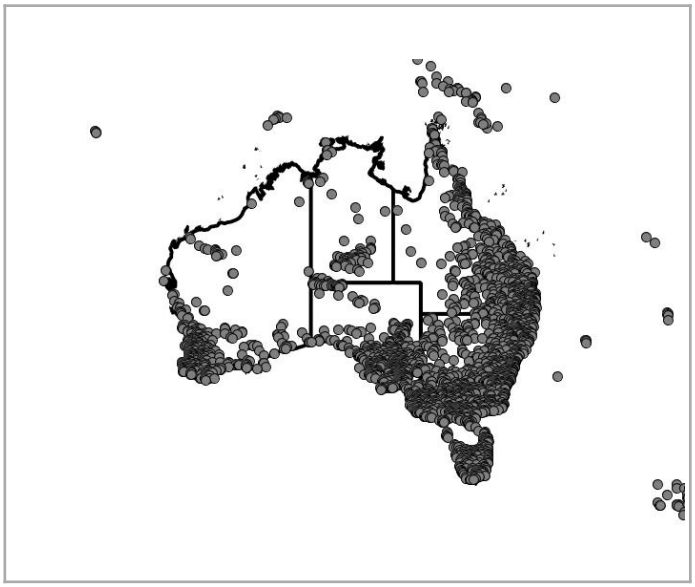
Oxalidaceae R.Br.

- Brown, R. in Tuckey, J.H. (1818) , Appendix No. V: Observations, systematical and geographical, on Professor Christian Smith's collection of plants from the vicinity of the River Congo. *Narrative of an expedition to explore the river Zaire, usually called the Congo, in South Africa, in 1816*

Val Stajsic

Perennial, rarely annual, herbs, sometimes succulent (not in Australia), often with fleshy rhizomes, bulbs, corms or tubers, rarely bulbils present, or shrubs, small trees, or sometimes vines (not in Australia); juice acrid because of soluble calcium oxalate accumulation. Leaves alternate and spiral, herbaceous species often forming a basal rosette, digitate or pinnate (paripinnate in *Biophytum,* the terminal leaflet is reduced to a bristle or mucro), trifoliolate or rarely unifoliolate, often with prominent pulvini; petiole usually well-developed, sometimes expanded into a blade-like phyllodium, or woody and persistent; stipules present or absent; leaflets entire; leaflets often exhibiting sleep movements, with the leaflets folded at night, sometimes sensitive to touch. Inflorescence often cymose (sometimes umbel-like), or sometimes reduced to a single flower, axillary; bracts and bracteoles usually present. Flowers actinomorphic, hypogynous, bisexual, usually heterostylous (distylous or tristylous), or rarely plants androdioecious (not in Australia), rarely some cleistogamous and apetalous (not in Australia). Sepals 5, free, quincuncially overlapping, persistent in fruit. Petals 5, free or slightly connate, usually convolute or seldom imbricate, contorted, base clawed, sometimes with multicellular glandular hairs. Stamens usually 10 in two whorls, filaments connate basally, outer filaments shorter than inner, or sometimes 5 without anthers (not in Australia); anthers extrorse; dithecal, tetrasporangiate, dehiscing by longitudinal slits. Nectary disc absent, but often the outer filaments thickened and producing nectar at base, or nectary-gland borne at base of outer petals. Gynoecium of 5 connate carpels. Ovary superior, 5-locular; styles usually 5, free; stigmas usually capitate or punctate. Ovules (1–) 2–8 (–10) per locule; placentation axile or rarely parietal. Fruit a loculicidal capsule (*Biophytum* – sometimes splitting to base into 5 spreading valves (not in Australia), and *Oxalis*), or a 5-ribbed berry. Seeds 1–10 per locule, with fleshy endosperm; arils usually present (absent in *Averrhoa bilimbi* and *Sarcotheca,* not in Australia), in those species with capsules, the elastic, translucent arilliform epidermis turns inside out, explosively ejecting the seeds from the capsule.

Distribution: Five genera and c. 570 species (Cocucci 2004, Mabberley 2017); 3 genera in Australia and 31 species: *Averrhoa* (1 sp., introduced), *Biophytum* (1 sp.) and *Oxalis* (29 spp., 22 introduced), the latter two occuring naturally in Australia. The Oxalidaceae occur mostly in the tropics and subtropics of both hemispheres but extend into temperate regions. *Averrhoa* is a genus of 2 species, probably of Indomalayan origin, but spread by people throughout the tropics. *Biophytum* is a genus of c. 50 species widespread in the tropical areas of America, Africa and Asia, and is most diverse in Madagascar, with *Biophytum petersianum* Klotzsch extending to Australia. *Dapania* is a genus of 3 species, 2 of which occur in Malaya, Sumatra and Borneo, and 1 in Madagascar. *Oxalis* is a cosmopolitan genus, and the most speciose, with c. 500 species mainly in tropical and subtropical zones, but also extending to arctic and subantarctic zones, most diverse in South Africa and Andean South



Etymology: Based on *Oxalis* L., from the Greek *oxys* (acid, sour, sharp) and *alis* (saltiness), in allusion to the salty, pungent taste of the stems and leaves (Baines 1981).

Common Name: Wood Sorrel family, including Carambola, Star Fruit, Wood Sorrel.

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Type: Oxalis L.

Diagnostic Features: Oxalidaceae may be recognised by their usually compound leaves with pulvinate leaflets, the leaflets which are entire. The inflorescence is usually cymose, and the flowers are actinomorphic, hypogynous and usually heterostylous. The stamens are in 2 series and of two lengths. The styles are free and usually have capitate stigmas. The fruit is usually a more or less ribbed loculicidal capsule (Stevens 2001 onwards).

Chromosome Numbers: Numerous chromosome counts available for *Oxalis*, *n* = 5–52, usually *n* = 7; *Biophytum* has *n* = 7–16; *Averrhoa* has *n* = 11 and 12 (Cocucci 2004).

Biostatus: Native and introduced.

Uses: The fruit of *Averrhoa carambola* (Star Fruit) is edible, and is sometimes used as a bleaching agent (Cocucci 2008). Many species of *Oxalis* are cultivated as ornamentals for their showy flowers and foliage. The tubers of *Oxalis tuberosa* (Oca), a crop from Andean civilisations, are locally important as an alternative to potatoes.

Nomenclature and Typification: Oxalidaceae R.Br., in Tuckey, J.H., Appendix No. V: Observations, systematical and geographical, on Professor Christian Smith's collection of plants from the vicinity of the River Congo. *Narrative of an expedition to explore the river Zaire, usually called the Congo, in South Africa, in 1816*: 433 (1818), *nom. cons.* Type: *Oxalis* L.
Taxonomic Synonym
Averrhoaceae Hutch., *Families of Flowering Plants* 2nd edn: 356 (1959).

Taxonomic Notes: Monophyly of Oxalidaceae is supported by morphological and DNA characters (Price & Palmer 1993). Oxalidaceae has traditionally been placed close to the Geraniaceae in the order Geraniales. However, phylogenetic studies based on DNA sequences indicate that the Oxalidaceae are most closely related to the Connaraceae (Savolainen *et al*. 2000, Stevens 2001 onwards), a pantropical family of mostly woody lianas. A study of the comparative floral structure of the Oxalidales also supports the close relationship between Connaraceae and Oxalidaceae (Matthews & Endress 2002).

Notes: In Australia, some naturalised species are serious weeds of native vegetation, cultivated pastures and gardens.

Bibliography:
Australian Plant Name Index (APNI): https://biodiversity.org.au/nsl/services/search [Last accessed 8 August 2018]
Baines (1981). *Australian Plant Genera: an etymological dictionary of Australian plant genera*. (Society for Growing Australian Plants: Chipping North).
Bennett, E.M. (1987). Oxalidaceae, in Marchant, N.G., Wheeler, J.R., Rye, B.L., Bennett, E.M., Lander, N.S. & Macfarlane, T.D., *Flora of the Perth Region* 1: 492–496. (Western Australian Herbarium, Department of Agriculture: W.A.).
Bentham, G. (1863). Geraniaceae, in *Flora Australiensis: a description of the plants of the Australian Territory* Volume II. *Ranunculaceae to Anacardiaceae*, pp. 194–301. (Lovell Reeve: London).
Burbidge, N.T. & Gray, M. (1970). *Flora of the Australian Capital Territory.* (Australian National University Press: Canberra).
Conn, B.J. (1992). Oxalidaceae, in Harden, G.J. (ed.), *Flora of New South Wales* 3: 17–22. (New South Wales University Press: Kensington). See also *New South Wales Flora Online*: http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=fm&name=OXALIDACEAE [Accessed 20 June 2019]

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Conn, B.J. (1999). Oxalidaceae, in Walsh, N.G. & Entwisle, T.J. (eds), *Flora of Victoria* 4: 207–218. (Inkata Press: Melbourne). See also *VicFlora (Flora of Victoria)*: https://vicflora.rbg.vic.gov.au/flora/taxon/53b6d9cf-ebde-4dac-ad38-9a41bac67d68 [Accessed 20 June 2019]
Cocucci, A.A. (2004). Oxalidaceae, in Kubitzki, K. (ed.), *The Families and Genera of Vascular Plants* 6: 285–289. (Springer: Germany).
Cronquist, A.J. (1981). *An Integrated System of Classification of Flowering Plants*. (Columbia University Press: New York).
Culham, A. (2007). Oxalidaceae, in Heywood, V.H., Brummitt, R.K., Culham, A. & Seberg, O., *Flowering Plant Families of the World* (Updated and revised), pp. 238–239. (Firefly Books: Ontario, Canada).
Curtis, W.M. & Morris, D.I. (1975). Oxalidaceae, *The Student's Flora of Tasmania* 2nd edn, 1: 100–102.
Fiaschi, P. (2010). Neotropical Oxalidaceae, in Milliken, W., Klitgård, B. & Baracat, A. (2009 onwards), *Neotropikey - Interactive key and information resources for flowering plants of the Neotropics*. http://www.kew.org/science/tropamerica/neotropikey/families/Oxalidaceae.htm [Last accessed 8 August 2018]
Gray A.M. (2011). Oxalidaceae, version 2011: 1, in M.F. Duretto (ed.), *Flora of Tasmania Online*. (Tasmanian Herbarium, Tasmanian Museum & Art Gallery: Hobart).
http://demo1.tmag.tas.gov.au/treatments/families/Oxalidaceae/Oxalidaceae.html [accessed November 2018]
Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. & Donoghue, M.J. (2016). *Plant Systematics: a phylogenetic approach* 4th edn. (Sinauer Associates Inc.: Sutherland, Massachusetts, U.S.A.).
Liu, Q. & Watson, M. (2008). Oxalidaceae, in Zhengui, W. & Raven, P.H., *Flora of China* 11: 1–6. (Science Press: Beijing, and Missouri Botanic Gardens Press: St Louis). http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=103966 [Last accessed 8 August 2018]
Morley, B.D. & Toelken, H.R. (1983). *Flowering Plants in Australia*. (Rigby: Adelaide).
Matthews, M.L. & Endress, P.K. (2002). Comparative floral structure and systematics in Oxalidales (Oxalidaceae, Connaraceae, Brunelliaceae, Cephalotaceae, Cunoniaceae, Elaeocarpaceae, Tremandraceae). *Botanical Journal of the Linnean Society* 140(4): 321–381. http:// https://academic.oup.com/botlinnean/article/140/4/321/2433671 [Last accessed 8 August 2018]
Nesom, G.L., (2016). Oxalidaceae, in Flora of North America Editorial Committee (ed.), *Flora of North America* 12: 113–153. (Oxford University Press: New York).
http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=10644 [Last accessed 8 August 2018]
Price, R.A. & Palmer, J.D. (1993). Phylogenetic relationships of Geraniaceae and Geraniales from *rbcL* sequence comparisons. *Annals of the Missouri Botanical Garden* 80(3): 661–671.
Ross, E.M. (1984). Oxalidaceae, in Stanley, T.D. & Ross, E.M., *Flora of South-eastern Queensland* 1: 397–398. (Queensland Department of Primary Industries: Brisbane).
Savolainen, V., Fay, M.F., Albach, D.C., Backlund, A., Van Der Bank, M., Cameron, K.M., Johnson, S.A., Lledo, M.D., Pintaud, M.D., Powell, M., Sheanhan, M.C., Soltis, D.E., Soltis, P.S., Weston, P., Whitten, W.M., Wurdack, K.J. & Chase, M.W. (2000). Phylogeny of the eudicots: a nearly complete familial analysis based on *rbcL* gene sequences. *Kew Bulletin* 55: 257–309.
Stevens, P.F. (2001 onwards). Angiosperm Phylogeny Website. Version 14, April 2015 [and more or less

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Nomenclature

CHAH (2008) , *Australian Plant Census*

orthographic variant: Oxalideae R.Br.

Images

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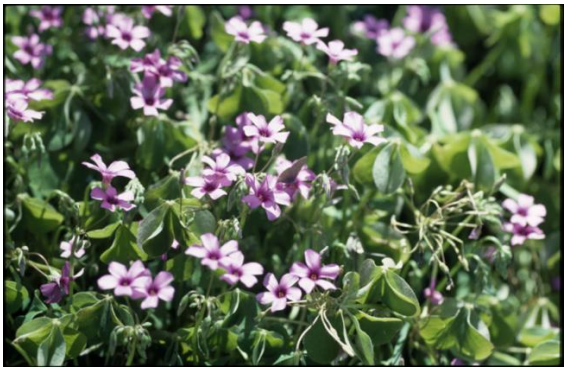

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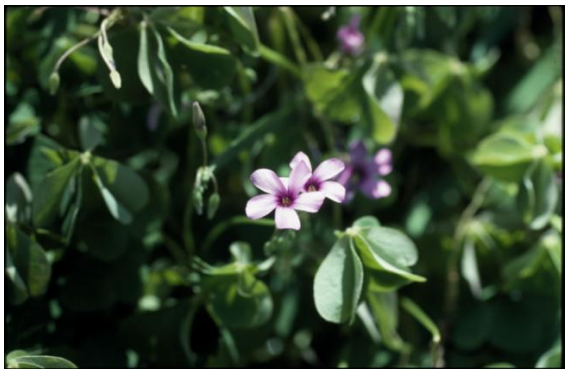

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Flora of Australia: vascular plants Oxalidaceae key

From: **Thiele, K.R.** (2012).

1	Leaves digitately 3(4)-foliolate	Oxalis
1	Leaves paripinnate	Biophytum: Biophytum petersianum

Acknowledgements

Editor

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