

FLORA OF NEW ZEALAND

FERNS AND LYCOPHYTES

ONOCLEACEAE



P.J. BROWNSEY & L.R. PERRIE

Fascicle 28 – DECEMBER 2020

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Cover image: *Onoclea sensibilis*. Herbarium specimen of cultivated plant from near Swanson, Auckland. CHR 229544.

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Introduction

Onocleaceae is a small family previously included in Dryopteridaceae but now shown to be sister to Blechnaceae. It is largely confined to north temperate regions, with the greatest diversity in China. It is represented in New Zealand by a single naturalised species, *Onoclea sensibilis*, which has been collected once from Nelson.

The species is recognised by its long-creeping rhizomes and strongly dimorphic fronds. The sterile fronds are pinnatifid to pinnate-pinnatifid, with broad segments and reticulate veins, whereas the fertile fronds are much narrower, 2-pinnate, and with free veins. The fertile pinnae are linear, bearing very short, rounded, bead-like secondary pinnae, and sori tightly enclosed by the strongly inrolled margins.

***Onocleaceae* Pic.Serm., *Webbia* 24: 708 (1970)**

Type taxon: *Onoclea* L.

Terrestrial ferns. Rhizomes long-creeping (NZ) or short-creeping to erect (not NZ), scaly. Fronds dimorphic, not articulated to rhizome. Sterile laminae pinnatifid to 1-pinnate-pinnatifid, catadromous, papery or herbaceous or coriaceous, glabrous or with very scattered scales and hairs. Fertile laminae 1–2-pinnate, blade greatly reduced, coriaceous. Veins free or reticulate, areoles without included veinlets. Sori round, on short receptacles, borne on abaxial surface, enclosed by inrolled pinna margins; paraphyses absent; indusia present or absent; sporangial maturation mixed. Sporangia with vertical annulus, usually 64 spores per sporangium. Homosporous; spores monoete, chlorophyllous; perispores with a few folds, minutely echinate.

Taxonomy: A family of four genera and five species (PPG1 2016), previously included in Dryopteridaceae (Kramer 1990). *Onocleaceae* is sister to *Blechnaceae* and includes *Matteucia*, *Onoclea*, *Onocleopsis* and *Pentarhizidium* (Gastony & Ungerer 1997; Smith et al. 2006).

Distribution: A family largely confined to north temperate regions but with one genus, *Onocleopsis*, extending into Mexico and Guatemala (Mickel & Smith 2004). The greatest diversity is found in China, with three genera and four species (Xing et al. 2013). One genus and species casual in New Zealand.

Biostatus: Exotic; casual.

Table 1: Number of species in New Zealand within *Onocleaceae* Pic.Serm.

Category	Number
Exotic: Casual	1
Total	1

Recognition: The *Onocleaceae* includes terrestrial ferns with strongly dimorphic fronds. The sterile fronds are pinnatifid to 1-pinnate-pinnatifid, and the fertile fronds 1–2-pinnate, with greatly reduced blades. The sori are round and enclosed by the inrolled pinna margins. Spores are monoete and chlorophyllous.

***Onoclea* L., *Sp. Pl.* 1062 (1753)**

Type taxon: *Onoclea sensibilis* L.

Etymology: From the Greek *onos* (vessel) and *kleiein* (to close), a reference to the sori being enclosed by the inrolled margins of the fertile pinnae.

Terrestrial ferns. Rhizomes long-creeping, scaly. Rhizome scales non-clathrate, broadly ovate, membranous, entire or undulate. Fronds strongly dimorphic; the fertile fronds shorter and greatly contracted, persistent 2–3 years; the sterile fronds deciduous, the bases swollen and surviving as storage organs over winter. Stipes chestnut-brown proximally, yellow-brown distally, glabrous or with a few scattered scales. Fertile laminae 2-pinnate, with the lamina greatly reduced, coriaceous, glabrous. Sterile laminae pinnatifid distally, pinnatifid to 1-pinnate-pinnatifid proximally, herbaceous or papery, glabrous or with scattered scales and hairs. Veins in fertile laminae free; veins in sterile laminae reticulate, areoles without free included veinlets. Sori round, on short receptacles, protected by strongly inrolled pinna margins; paraphyses absent. Indusia triangular, vestigial. Spores monoete, perispores with a few low folds and minutely echinate.

Distribution: *Onoclea* is a monotypic genus that occurs in eastern Asia and North America. One species occurs as a casual in New Zealand.

Biostatus: Exotic; casual.

Table 2: Number of species in New Zealand within *Onoclea* L.

Category	Number
Exotic: Casual	1
Total	1

Cytology: The base chromosome number *Onoclea* is $x = 37$ (Kramer 1990).

Onoclea sensibilis L., Sp. Pl. 1062 (1753)

Type: not designated (see Jarvis 2007)

Etymology: From the Latin *sensibilis* (sensitive), a reference to the susceptibility of this species to frost.

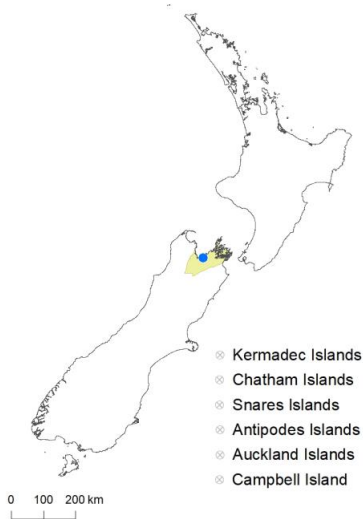


Fig. 1: *Onoclea sensibilis* distribution map based on databased records at AK, CHR & WELT.

pinnae are linear and the blade reduced to very short, rounded, bead-like secondary pinnae. The sori are round and enclosed by the strongly inrolled margins of the secondary pinnae. Indusia are present but not easily seen in mature fronds. The fertile fronds persist for 2–3 years but the sterile fronds are deciduous, at least in the northern hemisphere, surviving as swollen storage organs over winter.

Notes: A specimen of *Onoclea sensibilis* was collected from “Mr Baltrop’s garden, Nelson” by Marguerite Crookes in January 1958 (AK 50966). Conceivably this was the source of the material that became naturalised in Nelson.



Fig. 2: *Onoclea sensibilis*. Herbarium specimen of plant from Nelson, CHR 509661, showing strongly dimorphic fertile and sterile fronds.

Distribution: South Island: Sounds-Nelson.

Altitudinal range: c. 10 m.

Known only from one collection at Nelson.

Occurs naturally in eastern Asia and North America (Smith 1993; Xing et al. 2013).

Biostatus: Exotic; casual.

Habitat: Recorded as growing in crevices between concrete slabs near a stream.

First record: Heenan et al. (2004, p. 803). Voucher CHR 509661, 1996.

Recognition: *Onoclea sensibilis* is recognised by its long-creeping, scaly rhizomes and strongly dimorphic fronds. The sterile fronds are deeply pinnatifid distally, and either deeply pinnatifid or 1-pinnate-pinnatifid proximally, broadly ovate, herbaceous to papery, more or less glabrous and with reticulate veins. The primary pinnae are narrowly elliptic, with acute to obtuse apices and entire to deeply lobed margins. The fertile fronds are much narrower than the sterile fronds, 2-pinnate, linear, coriaceous and with free veins. The primary

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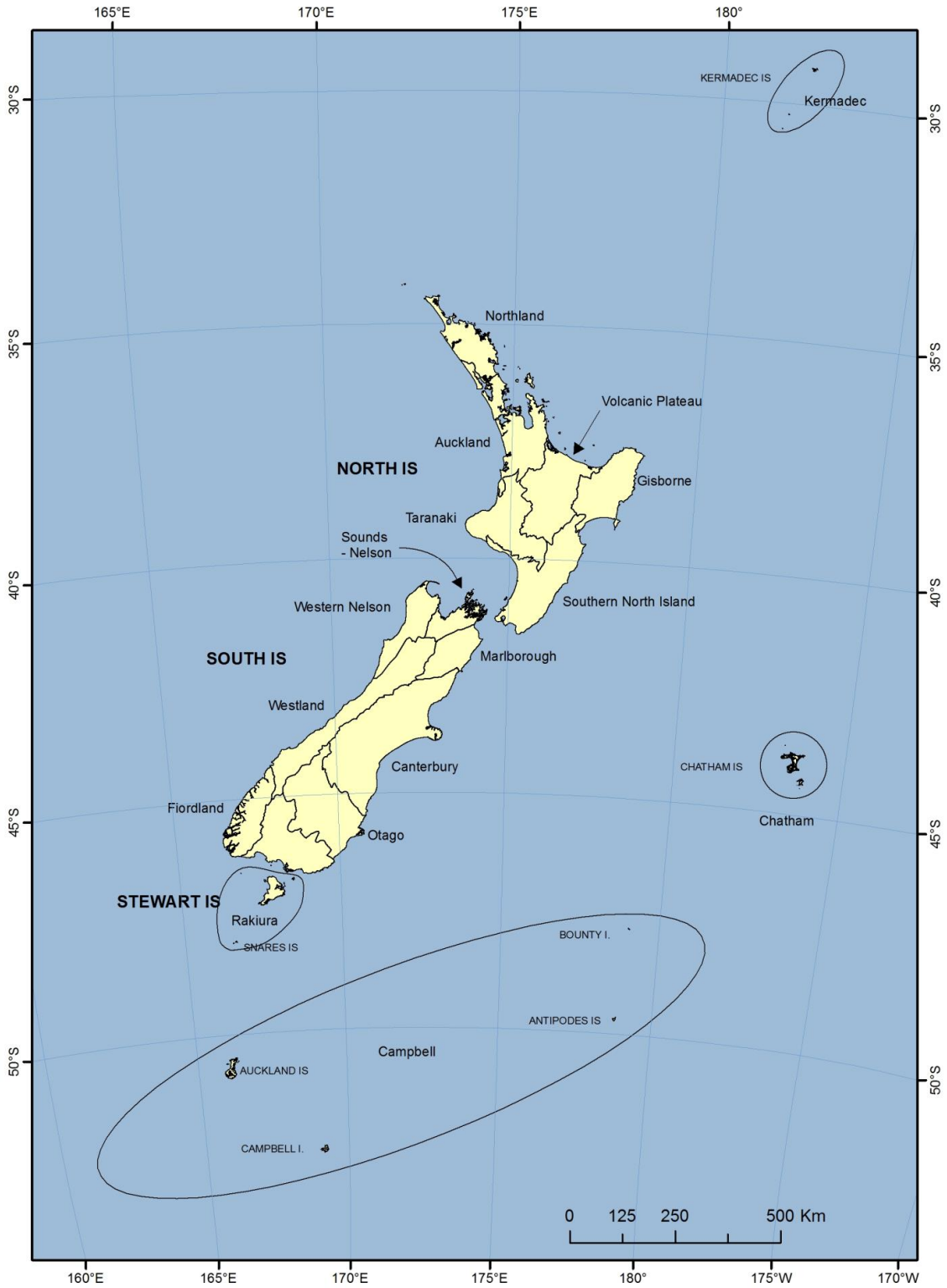
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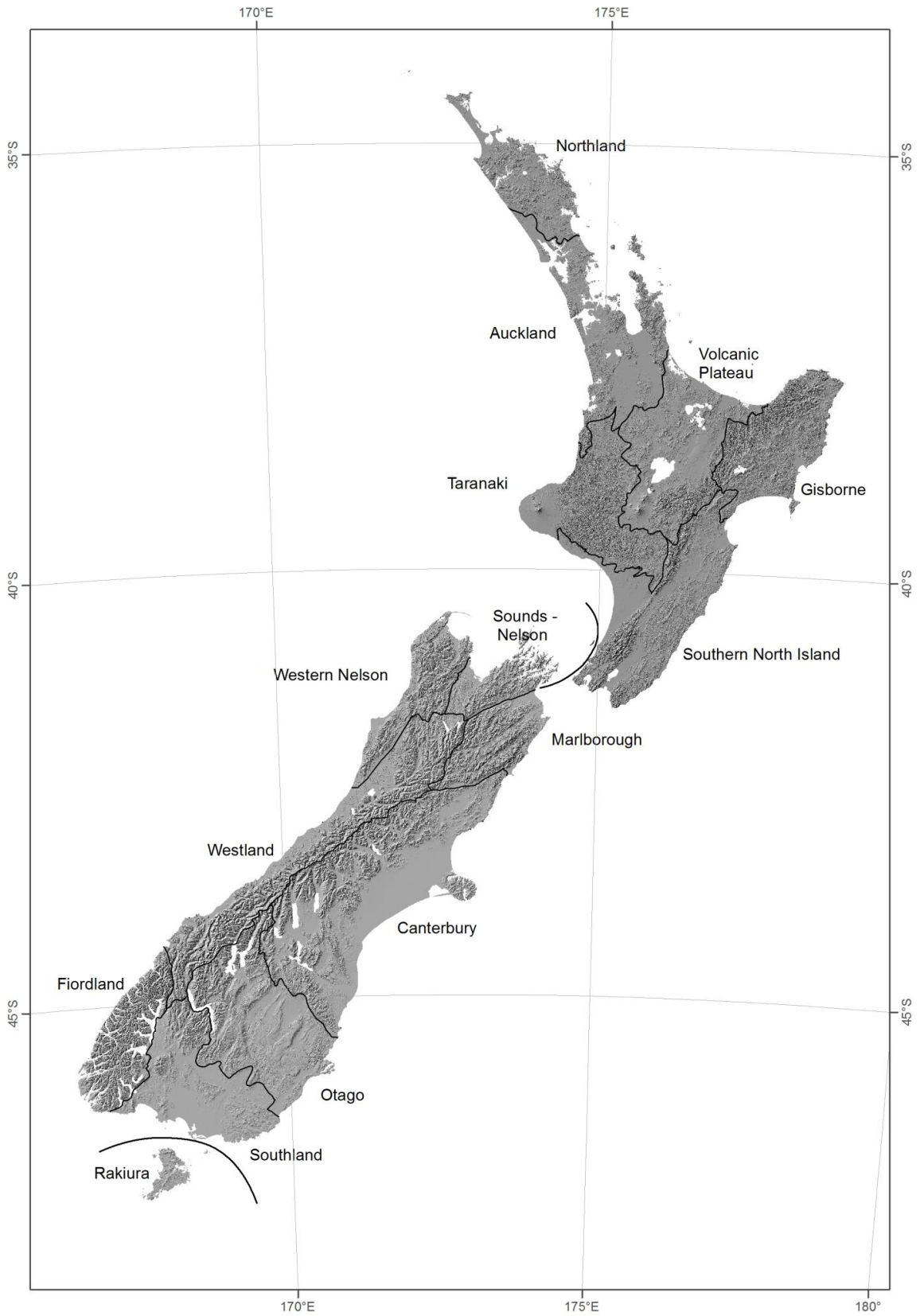
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Map 1: Map of New Zealand and offshore islands showing Ecological Provinces



Map 2: Map of New Zealand showing Ecological Provinces

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and *italic* for synonyms.

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Onoclea sensibilis L. 1, **3**

Onocleaceae Pic.Serm. 1, **2**

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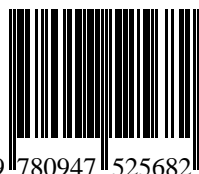
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