

stunning
seaweeds

beautiful browns

a guide to the large brown seaweeds of New Zealand

Version 1, 2016

Kate Neill
Wendy Nelson

with Michelle Kelly
& Blayne Herr

about this guide

Seaweeds or marine macroalgae occur around the world and are found from the high shore to depths of around 200 m in some places. They are the marine equivalent of land plants and they vary in size from small filament-like species to huge kelps. Large brown algae are common and obvious on most parts of New Zealand's coastline and we hope this guide will help you identify them in the field.

This first part of STUNNING SEaweEDS is a fully illustrated working e-guide to the most commonly encountered large seaweeds, the BEAUTIFUL BROWNS. It is designed for New Zealanders like you who live near the sea, dive and snorkel, explore our coasts, make a living from it, and for those who educate and are charged with kaitiakitanga, conservation and management of our marine realm. It is one in a series of e-guides on New Zealand marine seaweeds and invertebrates that NIWA's Coasts and Oceans group is presently developing.

The e-guide starts with a simple introduction to seaweeds, followed by a morphology (shape) index, species index, detailed individual species pages, and finally, icon explanations and a glossary of terms. As new species are discovered and described, new species pages will be added and an updated version of this e-guide will be made available.

Each seaweed species page illustrates and describes features that enable you to differentiate the species from each other. Species are illustrated with high quality images of the plants in life. As far as possible, we have used characters that can be seen by eye or magnifying glass, and language that is non-technical. Outlying island groups are shown on the maps as a two-letter code: Ke = Kermadec Islands; Ch = Chatham Islands; Bo = Bounty Islands; An = Antipodes Islands; Ak = Auckland Islands; Ca = Campbell Islands. Information is provided in descriptive text or quick reference icons that convey information without words. Icons are fully explained at the end of this document and a glossary explains unfamiliar terms.



Kate Neill is a marine biologist based in New Zealand at NIWA's Wellington office. Kate has been involved in marine macroalgae research for 15 years and has worked on various aspects of their diversity, taxonomy, distributions, aquaculture, and introduced species. Kate also works on starfish (Asteroidea) and is a co-author of the e-guide Extraordinary Echinoderms.

Wendy Nelson is a marine biologist/phytologist based in New Zealand at NIWA's Wellington office and the University of Auckland. Wendy is an authority on marine macroalgae, with a wide-ranging knowledge of all things seaweed, but for over 35 years has had a particular focus on macroalgal diversity and taxonomy. Wendy recently published an illustrated guide to New Zealand seaweeds.

For any advice on seaweeds you find, please email your photos and queries to Kate (kate.neill@niwa.co.nz) or Wendy (wendy.nelson@niwa.co.nz)

<http://www.niwa.co.nz/coasts-and-oceans/marine-identification-guides-and-fact-sheets>



Remember to check the websites for updated versions!

a typical species page layout

taxonomic name of species
Durvillaea antarctica (Cham.) Har.

taxonomic authority
 person(s) who first described this species

common name of species
 bull kelp, rimurapa

species classification
 see species index for arrangement
 Class: Phaeophyceae, Order: Fucales, Family: Durvillaceae

species images
 inset images show variations and/or closeup detail

body plan icon
 highlighting the basic shape, or a special characteristic, that defines a group of these organisms

life history icon
 highlighting geographic distribution

scale bar
 indicating relative size of organism in the main image

quick id icons
 highlighting shape, surface detail, habitat, and environment

scale of abundance

depth range
 common depth range around New Zealand

information
 details on external and internal characters and habitat

It could also be ...
Durvillaea paha
Durvillaea willana

key taxonomic references
 Adams, N.M. (1997) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

it could also be ...
 some species are difficult to tell apart without more detailed information, so check the other species in the guide listed here to make sure that you have the correct species

distribution
 section of coastline or around offshore islands where species is most commonly found

make notes of where you encountered this species and let us know if you find it at a new location

about seaweeds

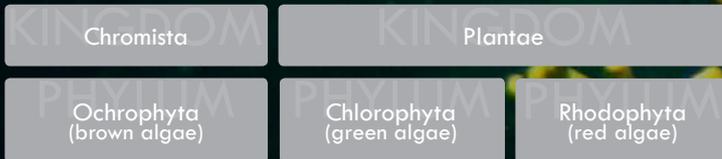
Seaweeds (marine macroalgae) are found in a great number of habitats, from the shallow intertidal zone, to snorkelling and diving depths and deeper. So it is quite likely that whenever you are in or on the sea a seaweed won't be far away. Seaweeds range in size from small filaments to huge plants more than 10 m high.

Like land plants, seaweeds photosynthesise and are grouped into three phyla, in two kingdoms, based on their photosynthetic pigments: **brown** (Ochrophyta), **green** (Chlorophyta) and **red** (Rhodophyta) seaweeds.

This first version of the Stunning Seaweeds e-guide focuses on some beautiful brown seaweeds. All of the species in this version of the guide are in the class Phaeophyceae. The brown seaweeds (phylum Ochrophyta) include the largest species of seaweeds and are often an obvious sight on shorelines, forming kelp forests in rocky areas. There are several commercial species of brown seaweeds, including those that produce alginates and several that are eaten e.g. wakame (*Undaria pinnatifida*).

The green seaweeds (phylum Chlorophyta) are the least diverse of the three phyla in New Zealand. Species of *Ulva* are known as sea lettuce and can form large blooms in some areas.

Phylum Rhodophyta (the red seaweeds) is the most diverse of the three phyla and includes some well-known species that produce agar (e.g. *Gracilaria*, *Pterocladia*) and the seaweed used in making sushi (known as Nori in Japan and karengo in New Zealand, species of *Pyropia* and *Porphyra*).



The main body of a seaweed is called a thallus – seaweeds don't have true leaves, or stems or roots like land plants. The main stem of a seaweed is usually called a stipe or axis, and the thallus is called a blade. Sometimes they have structures that look leaf-like. Seaweeds attach to rocky substrates with a variety of different holdfasts – sometimes very solid dome-like bases and other times made up of finger-like haptera that spread long the rock surface and attach to the rock. In this guide we use the terms **stipes** and **blades** throughout.



beautiful browns

brown seaweed

Large brown seaweeds (the Ochrophyta) form forests in the coastal zone. Growing on rocky substrates, these seaweeds provide three-dimensional structure and habitat for many other coastal species - invertebrates, fishes and other seaweeds.

There are two main types of large browns – true kelps and fucoids. The true kelps belong to the order Laminariales and have a life history where the conspicuous phase - the kelp phase (sporophyte) that you see on the shore or when you are diving - alternates with a microscopic phase (gametophyte). There are three genera of true kelps native to New Zealand – *Ecklonia*, *Lessonia* and *Macrocystis* – and one introduced kelp, *Undaria pinnatifida*.

The fucoids, or members of the Fucales have a direct life history in which egg and sperm are produced and fuse to form a zygote. There are many genera and species of Fucales in New Zealand – e.g. *Carpophyllum*, *Cystophora*, *Hormosira*, *Landsburgia*, *Marginariella*, *Sargassum*, *Xiphophora*. The species of *Durvillaea* that are known as bull kelp in New Zealand are actually fucoids and not true kelps.

Large brown seaweeds are very important along temperate coasts worldwide as they act as ecosystem engineers structuring the habitat and influencing the physical environment, affecting such features as light, nutrient concentrations and water movement. In addition to providing shelter and surfaces to settle on, seaweeds are also vitally important to local food chains as they contribute significant biomass.

Brown seaweeds are more closely related to various types of microscopic algae than they are to red or green seaweeds – they all share life in the sea and have some similarities in the ways they grow and attach to substrates, but they are actually very different from each other with respect to their origins.

 Chromista Plantae Ochrophyta Chlorophyta Rhodophyta

species index

KINGDOM
Chromista

PHYLUM
Ochrophyta

CLASS
Phaeophyceae

ORDER Dictyotales	Family Dictyotaceae	
	<i>Dictyota kunthii</i>	8
ORDER Fucales	Family Durvillaeaceae	
	<i>Durvillaea antarctica</i>	9
	<i>Durvillaea chathamensis</i>	10
	<i>Durvillaea poha</i>	11
	<i>Durvillaea willana</i>	12
	Family Hormosiraceae	
	<i>Hormosira banksii</i>	13
	Family Sargassaceae	
	<i>Carpophyllum angustifolium</i>	14
	<i>Carpophyllum flexuosum</i>	15
	<i>Carpophyllum maschalocarpum</i>	16
	<i>Carpophyllum plumosum</i>	17
	<i>Cystophora platylobium</i>	18
	<i>Cystophora retroflexa</i>	19
	<i>Cystophora scalaris</i>	20
	<i>Cystophora torulosa</i>	21
	<i>Landsburgia quercifolia</i>	22
	<i>Phyllotricha verruculosa</i>	23
	<i>Sargassum scabridum</i>	24
	<i>Sargassum sinclairii</i>	25
Family Seirococcaceae		
<i>Marginariella boryana</i>	26	
<i>Marginariella urvilliana</i>	27	
Family Xiphophoraceae		
<i>Xiphophora chondrophylla</i>	28	
<i>Xiphophora gladiata</i>	29	
ORDER Laminariales	Family Alariaceae	
	<i>Undaria pinnatifida</i>	30
	Family Laminariaceae	
	<i>Macrocystis pyrifera</i>	31
	Family Lessoniaceae	
<i>Ecklonia radiata</i>	32	
<i>Lessonia tholiformis</i>	33	
<i>Lessonia variegata</i>	34	

species index

KINGDOM
Chromista

PHYLUM
Ochrophyta

CLASS
Phaeophyceae

ORDER
Desmarestiales

Family Desmarestiaceae
Desmarestia ligulata

35

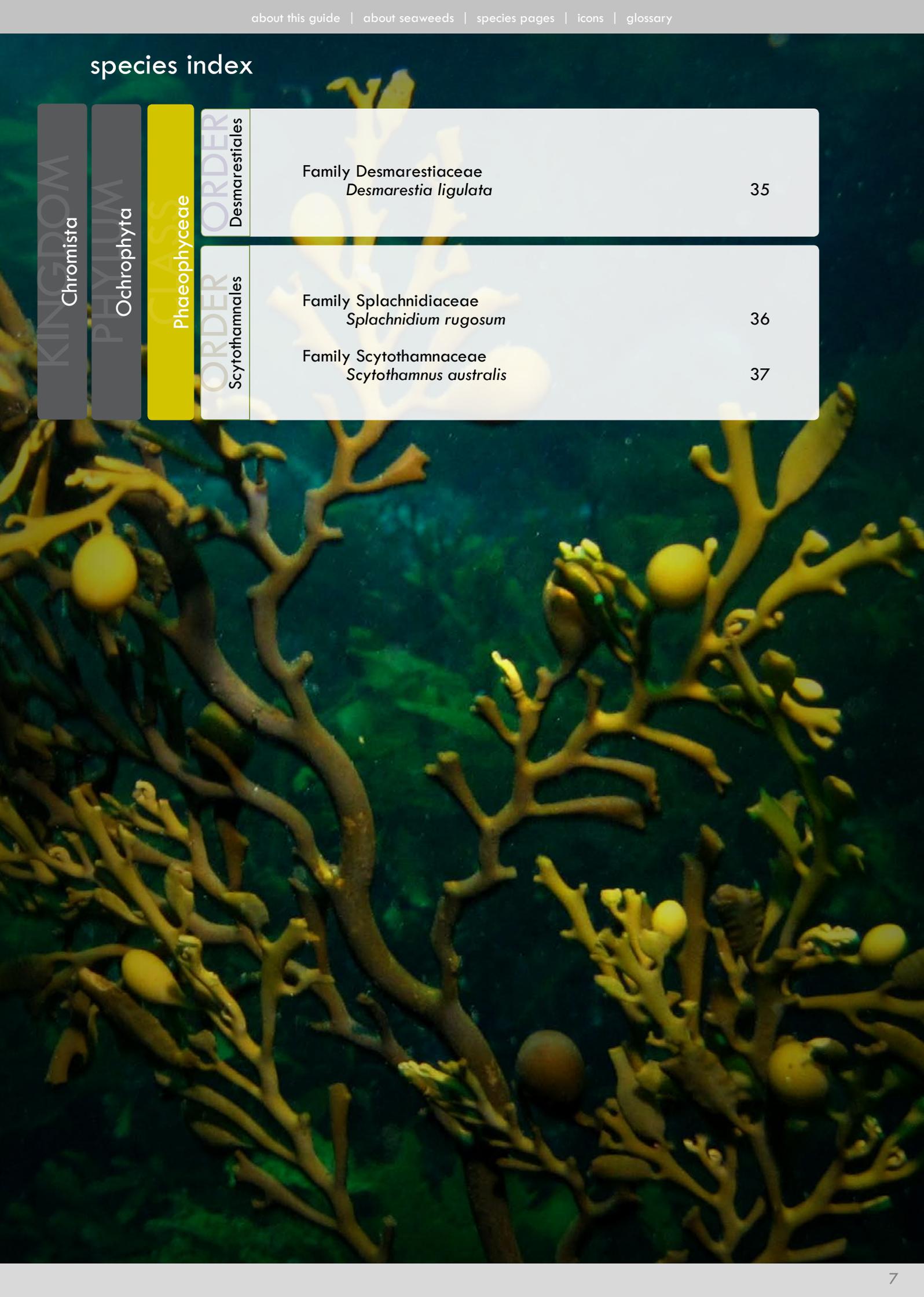
ORDER
Scytothamniales

Family Splachnidiaceae
Splachnidium rugosum

36

Family Scytothamnaceae
Scytothamnus australis

37



Dictyota kunthii (C.Agardh) Grev.

Return to Index

Previously known as *Glossophora kunthii*

Class Phaeophyceae Order Dictyotales Family Dictyotaceae



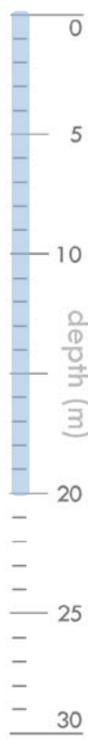
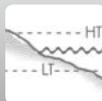
10 cm

main image: Erasmo, Macaya inset image: Tracy Farr

morphology

substrate

habitat



Plants are fan-like and up to 50 cm high. Blades divided into strap-like, forked sections, covered in small, fleshy tongues, can look shaggy when dense. Holdfast is hairy, almost felted, and has lobed, prostrate branches. Golden to olive brown, often dark brown at bases. Fertile structures are scattered over the blades but are not easily visible.

Found in the low intertidal to upper subtidal on open coasts around three Kings, North, South, Stewart and Chatham Islands. Also known from Norfolk Island, Chile and Peru.

It could also be.....
Xiphophora gladiata



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

bull kelp, rimurapa



1 m

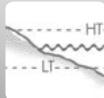
main image: Kate Neill | inset image: Erasmo Macaya

morphology

surface

substrate

habitat



Plants are made up of flattened blades and are massive, growing to 5 m long, or sometimes up to 10 m long. Blades often divided into strap-like portions, are thick and rubbery, with an internal honeycomb structure. In more exposed areas blades become narrower and more whip-like, however, they always remain rounded or oval in cross-section. Short stipe is cylindrical, unbranched, and grows from a large, dome-shaped holdfast. Golden to dark brown to olive green. Fertile structures are scattered over the blades but are not easily visible.

Found on rock in the low intertidal zone of exposed coasts around the Three Kings Islands in the north down to Stewart Island in the south, including Chatham, Bounty, Snares, Antipodes, Auckland and Campbell Islands. Also widespread in the Southern Ocean, South America and southern Atlantic islands.

It could also be.....

Durvillaea poha
Durvillaea willana

abundance





main image: Wendy Nelson inset image: Tracy Farr



Plants grow up to 15 m long and are made up of massive blades, usually not divided, flattened with parallel sides and wavy edges, no internal honeycomb structure. Stipe is unbranched, and grows from a large, dome-shaped holdfast. Dark brown. Fertile structures are scattered over the blades but are not easily visible.

Found in exposed areas from the low intertidal to about 2 m depth. Endemic to the Chatham Islands.

It could also be.....

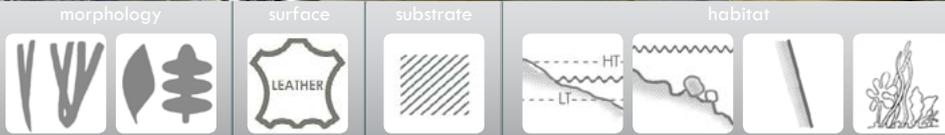
- Durvillaea antarctica*
- Durvillaea poha*

abundance





main image: Kate Neill inset image: Erasmo Macaya



Plants usually 5–10 m long, and are made up of massive blades, broad and flattened, with an internal honeycomb structure. Blades can become whip-like at the tips, but always remain broad and flattened in cross-section. Short stipe is orange-yellow and becomes flattened towards the tip. Holdfasts may join together with several stipes growing out of a clump. Blades orange-brown to golden. Fertile structures are scattered over the blades but are not easily visible.

Found in the intertidal in exposed areas, often in a band above *D. antarctica*, around southern South Island, Stewart, Snares and Auckland Islands.

D. poha was previously known as the shorter and broader 'cape form' of *D. antarctica*.

It could also be.....

- Durvillaea antarctica*
- Durvillaea willana*



Fraser, C.I., Spencer, H.G., Waters, J.M. (2012) *Durvillaea poha* sp. nov. (Fucales, Phaeophyceae): a buoyant southern bull-kelp species endemic to New Zealand. *Phycologia*, 51(2), 151–156.

Nelson, W. (2013) *New Zealand seaweeds. An illustrated guide*. Te Papa Press, Wellington, 328 pp.



1 m

main image: Wendy Nelson inset image: Kate Neill

morphology



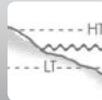
surface



substrate



habitat



Plants grow up to 5 m high and consist of massive blades, tough and leathery, sometimes divided into straps, with no internal honeycomb structure. Stipe is thick, cylindrical, and produces side branches. Holdfast a dome-shaped disc. Dark brown. Fertile structures are scattered over the blades but are not easily visible.

Found in the low intertidal to upper subtidal on exposed coasts of the southeastern corner of the North Island (but not Cook Strait), South Island and Stewart Island.

It could also be.....

Durvillaea antarctica

Durvillaea poha



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.

Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Neptune's necklace



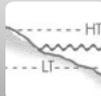
5 cm

main image: Kate Neill inset image: Tracy Farr

morphology



habitat



Plants up to 30 cm (sometimes 50 cm) high and consist of branched chains of hollow 'beads' joined together by thin constrictions. Beads vary in size according to habitat and exposure. Attaches by a small disc. Yellow-green to grey-brown. Fertile structures are scattered over the beads and are easily visible as small bumps.

Found on rocks or stones in the intertidal zone in sheltered or exposed sites around North, South, Stewart and Chatham Islands. Also known from Australia.



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

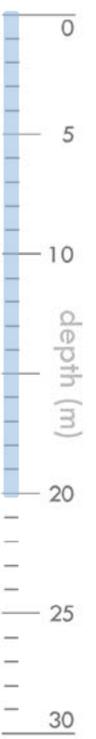
Class Phaeophyceae Order Fucales Family Sargassaceae



70 cm

main image: Kendall Clements inset image: Wendy Nelson

morphology	substrate	habitat			



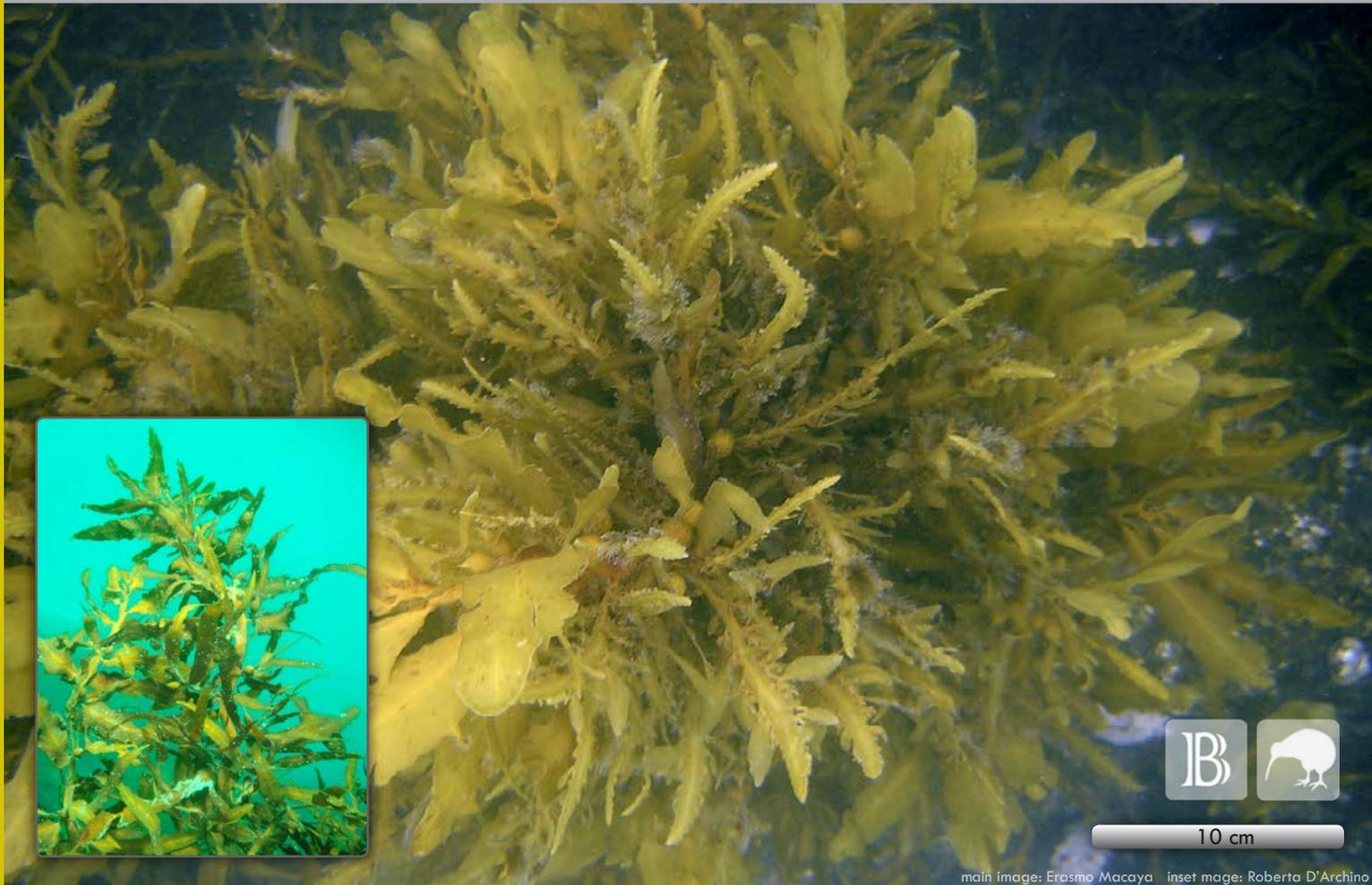
Plant is shrub-like and up to 1.5 m high. Consists of leaf-like blades carried on either side of branches, stems are cylindrical; air bladders are egg-shaped. Holdfast is made up of flattened branches with peg-like attachments. Dark brown. Fertile structures occur in bunches on the upper branches, in the angle between the stem and leaves.

Found in the low intertidal to subtidal on exposed coasts or in surge channels around Three Kings Islands and northern North Island.

It could also be.....
Carpophyllum maschalocarpum
Carpophyllum flexuosum



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.



10 cm

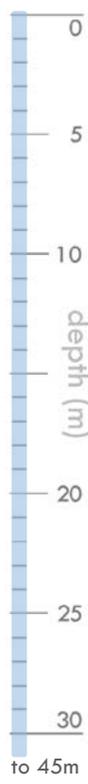
main image: Erasmo Macaya inset image: Roberta D'Archino

morphology	substrate	habitat

Plant is shrub-like and up to 2 m high. Leaf-like blades are carried on branches either side of a main stem, which is flattened and zig-zags slightly. Lower leaves are broader and have a midrib; air bladders are rounded. Holdfast is flattened and creeping. Golden brown to dark brown. Fertile structures occur on specialised upper branches with small leaves. These specialised branches are found in the angle between the stem and leaves.

Found in the upper subtidal, or in deep pools and channels, or deeper in sheltered areas around North, South, Stewart and Chatham Islands.

It could also be.....
Carpophyllum angustifolium
Carpophyllum maschalocarpum



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.



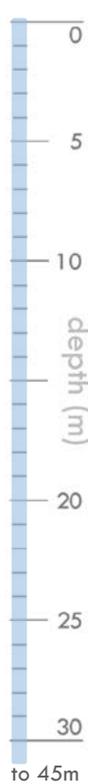
main image: Erasmo Macaya inset image: Kate Neill

morphology	substrate	habitat	

Plant is shrub-like and up to 1.5 m high. Blades are leaf-like and are carried on branches either side of a stem, which is broad and flattened; air bladders are egg-shaped. Holdfast is flattened and has lateral peg-like attachments. Dark brown. Fertile structures are in tight bundles between the leaf and stem.

Found in the low intertidal to upper subtidal in sheltered areas or on exposed coasts around North, South and Chatham Islands.

It could also be.....
Carpophyllum angustifolium
Carpophyllum flexuosum
Cystophora platylobium



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Fucales Family Sargassaceae



40 cm

images: Kate Neill

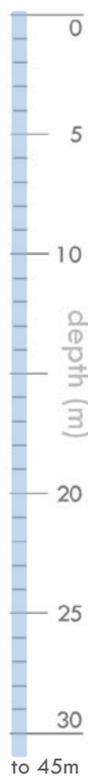
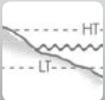
morphology



substrate



habitat



Plant is shrub-like and up to 1.0 m high. Blades are divided, varying from oak leaf-shaped to very finely divided, and occur on branches either side of a stem, which is flattened; air bladders are stalked and rounded. Holdfast is a prostrate extension of the stem. Golden to greenish brown. Fertile structures are on long branches in the angle between stem and leaf.

Found in the low intertidal to upper subtidal in moderately sheltered or exposed coasts around Three Kings Islands, eastern North Island and the Chatham Islands.

It could also be.....
Landsbergia quercifolia



Adams, N.M. (1994) *Seaweeds of New Zealand: An illustrated guide*. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) *New Zealand seaweeds. An illustrated guide*. Te Papa Press, Wellington, 328 pp.



5 cm

main image: Lou Hunt inset image: Roberta D'Archino

morphology	substrate	habitat



Plants are shrub-like and up to 2 m high. Blades are flat, leaf-like lobes occurring alternately along side branches. Main stalk is flattened. Air bladders are round to slightly oval. Holdfast disc to cone-shaped. Golden to dark brown. Reproductive structures are in two rows on leaf-like structures but aren't easy to see.

Found in the subtidal on open, exposed coasts, usually in deep water around southern North Island, South and Stewart Islands. Also known from Australia.

It could also be.....
Carpophyllum maschalocarpum



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Fucales Family Sargassaceae



20 cm

main image: Erasmo Macaya Inset image: Kate Neill

morphology	substrate	habitat



Plants are shrub-like and up to 1.5 m or more high. Branchlets are narrow and cylindrical and occur in groups on side branches that bend back from their point of origin. Branchlets are arranged around the stem giving a bushy appearance. Main stems are flattened and sometimes twisted. Air bladders are oval to round on short stalks. Holdfast solid and conical. Medium to dark greyish-brown. Reproductive structures are in two rows on the cylindrical branchlets but aren't easy to see.

Found in the upper subtidal to subtidal on open, exposed coasts, around North, South, Stewart and Chatham Islands, usually to about 10 m depth. Also known from Australia.

It could also be.....
Cystophora scalaris
Cystophora torulosa



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.



25 cm

Image: Malcolm Francis

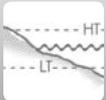
morphology



substrate



habitat



Plants are shrub-like and up to 1m high. Branchlets are narrow and cylindrical and occur in closely packed, flattened groups on alternating side branches. Main stalks are tough and zig-zag strongly. Air bladders are oval to round. Holdfast solid and conical. Dark grey-brown. Reproductive structures occur on the cylindrical branchlets but aren't easy to see.

Found in the low intertidal to subtidal on exposed coasts around southern North Island, South, Stewart, Chatham and Auckland Islands.

It could also be.....

- Cystophora retroflexa*
- Cystophora torulosa*



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.

Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Fucales Family Sargassaceae



10 cm

images: Erasmo Macaya

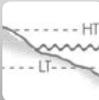
morphology



substrate



habitat



Plants are shrub-like and up to 1 m high. Branchlets are swollen and club-shaped and occur in bunches on alternating side branches. Main stems are thick and cylindrical at the base, but flattened above. Air bladders round. Holdfast solid and conical. Golden brown. Reproductive structures are in two rows on the club-shaped blades but aren't easy to see.

Found in the low intertidal to upper subtidal on exposed coasts, around North, South, Stewart and Chatham Islands. Also known from Australia.

It could also be.....
Cystophora retroflexa
Cystophora scalaris



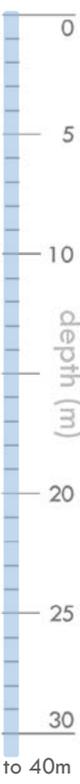
Adams, N.M. (1994) *Seaweeds of New Zealand: An illustrated guide*. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) *New Zealand seaweeds. An illustrated guide*. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Fucales Family Sargassaceae



main image: Roberta D'Archino inset image: Erasmo Macaya

morphology	substrate	habitat



Plants grow up to 1.5 m high and are shrub-like with small oakleaf-shaped leaves that are flattened with a faint midrib, and occur on alternate branches. Main stems are cylindrical and have scars from shed branches. Holdfast solid and conical. Dark brown. Reproductive structures are small, specialised, thicker leaves with serrated margins found on the upper branches.

Found in the subtidal to deep water on open coasts around Three Kings, North, South, Stewart and Chatham Islands.

It could also be.....
Carpophyllum plumosum



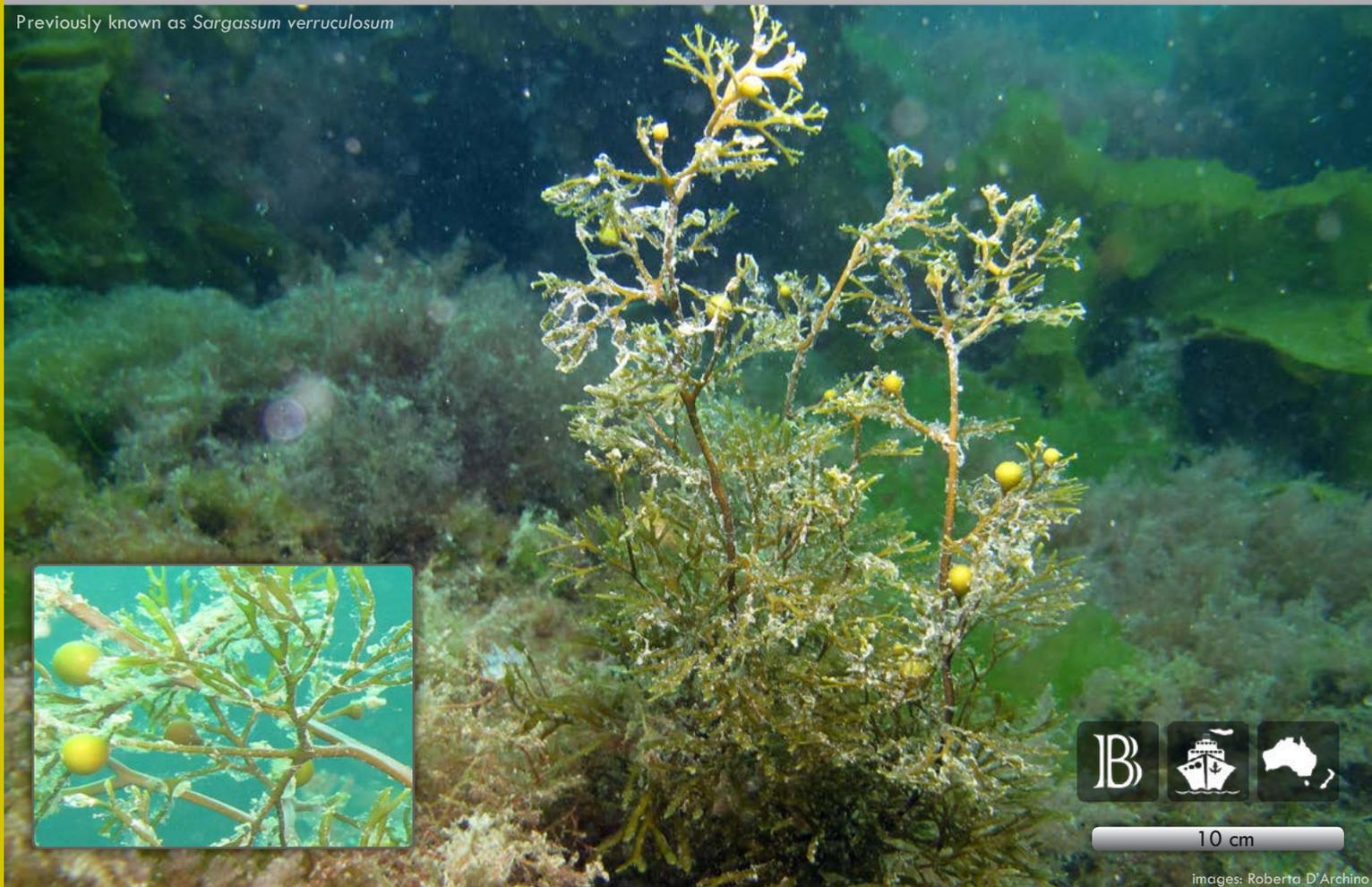
Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Phyllotricha verruculosa (C. Agardh) R.R.M Dixon & Huisman

Return to Index

Previously known as *Sargassum verruculosum*

Class Phaeophyceae Order Fucales Family Sargassaceae



10 cm

images: Roberta D'Archino

morphology



substrate



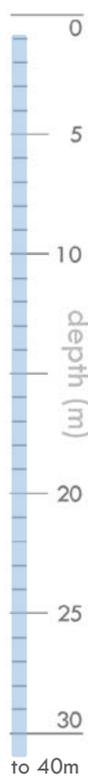
habitat



Plants grow up to 1m or more high and are shrub-like with blades that are leaf-like and variably shaped, carried on forked branches. Main stem is thick at base but becomes thinner further up. Air bladders rounded. Holdfast conical and disc-like with developing branches. Mid-brown. Reproductive structures scattered in upper branches and not easily visible.

Found in the subtidal in sheltered bays and harbours around South Island and Stewart Island. Also known from Australia. This species is considered to have been introduced to New Zealand in the 19th century by whaling and sealing vessels.

It could also be.....
Sargassum sinclarii



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.



Images: Wendy Nelson

morphology	substrate	habitat

Plants grow to 1m high and are shrub-like with leaf-like blades with a midrib and serrated margin. Blades occur on bushy, branched stems which are cylindrical and have spines; air bladders small and rounded. Holdfast conical. Golden brown. Fertile structures occur in the upper branches, swollen and warty.

Found in the low intertidal to subtidal in pools on open coasts around the Kermadec Islands and northern New Zealand.

It could also be.....
Sargassum sinclairii



Adams, N.M. (1994) *Seaweeds of New Zealand: An illustrated guide*. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) *New Zealand seaweeds. An illustrated guide*. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Fucales Family Sargassaceae



30 cm

main image: Roberta D'Archino, inset image: Erasmo Macaya

morphology	substrate	habitat	



Plants grow to 1m high and are shrub-like with leaf-like blades with a midrib and toothed margin. Blades are on bushy branched stems, which are rounded or slightly flattened; leaves at base are large, leaves on upper branches are smaller; air bladders stalked and rounded. Holdfast domed. Golden brown. Fertile structures are lobed or toothed and are carried on stalks.

Found in the low intertidal to upper subtidal on moderately exposed coasts, often in pools or channels, around Three Kings, North, South, Stewart and Chatham Islands.

It could also be.....
Sargassum scabridum
Carpophyllum flexuosum (lower leaves only)



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Marginariella boryana (A. Rich) Tandy.

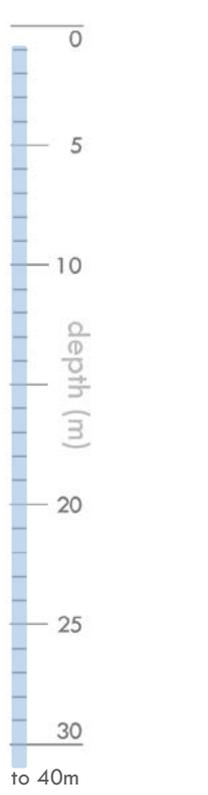
Class Phaeophyceae Order Fucales Family Sirococcoceae



10 cm

main image: Chris Hebburn inset image: Erasmo Macaya

morphology		substrate		habitat	



Plants grow to more than 2 m high and are comprised of blades that are long and strap-like with toothed edges. Blades alternate on opposite edges of the stem, which is flattened and twists sharply above the holdfast, stem is bare below; air bladders egg-shaped and occur on margin of the blades, sometimes with a point. Holdfast conical and made up of many thin branches. Golden brown. Fertile structures are finger-like (inset image) and grow from the edges of blades on one side only.

Found from the low intertidal to subtidal on exposed coasts around southern North Island, South, Stewart, Chatham and Snares Islands.

It could also be.....
Marginariella urvilliana



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Marginariella urvilliana (A. Rich) Tandy.

Return to Index

Class Phaeophyceae Order Fucales Family Seirococcaceae



10 cm

main image: Roberta D'Archino inset image: Lou Hunt



Plants grow to 2 m high and consist of long and strap-like blades with toothed edges. Blades alternate on opposite edges of the stem, which is flattened and twists sharply above the holdfast, stem is bare below; air bladders round and grow on the margins of the blades. Holdfast conical made up of many thin branches. Golden brown. Fertile structures are finger-like and grow from the edges of the blades on one side only.

Found in the low intertidal to subtidal on exposed coasts around southern North Island, South, Stewart, Chatham, Snares and Auckland Islands.

It could also be.....
Marginariella boryana



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.



main image: Chris Hepburn, inset image: Kate Neill



Plants grow to 30–50 cm high and consist of forked and strap-like blades that become narrower and more forked towards the tips, towards the base branches are rounded to flattened. Holdfast a flattened extension of the lower stem. Grey-brown. Reproductive structures are sunken in the upper branches and not easily visible.

Found in the low intertidal to subtidal on exposed coasts around Three Kings Islands and northern North Island. Also known from Australia.



Adams, N.M. (1994) *Seaweeds of New Zealand: An illustrated guide*. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) *New Zealand seaweeds. An illustrated guide*. Te Papa Press, Wellington, 328 pp.



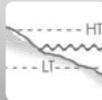
10 cm

main image: Roberta D'Archino inset image: Jenn Dalen

morphology

substrate

habitat



Plants grow up to 50 cm high and consist of strap-like, flattened, elongate blades on forked branches, forming flat, fan-shaped plants. Holdfast solid and disc-like. Grey-green-brown. Reproductive structures are sunken in the upper branches and not easily visible.

Found in the low intertidal to subtidal on exposed coasts around southern North Island, South, Stewart, Chatham, Snares, Antipodes, Auckland and Campbell Islands. Also known from Australia.

It could also be.....
Dictyota kunthii

abundance



Wakame



30 cm

main image: Kate Neill inset image: Sheryl Miller

morphology

substrate

habitat



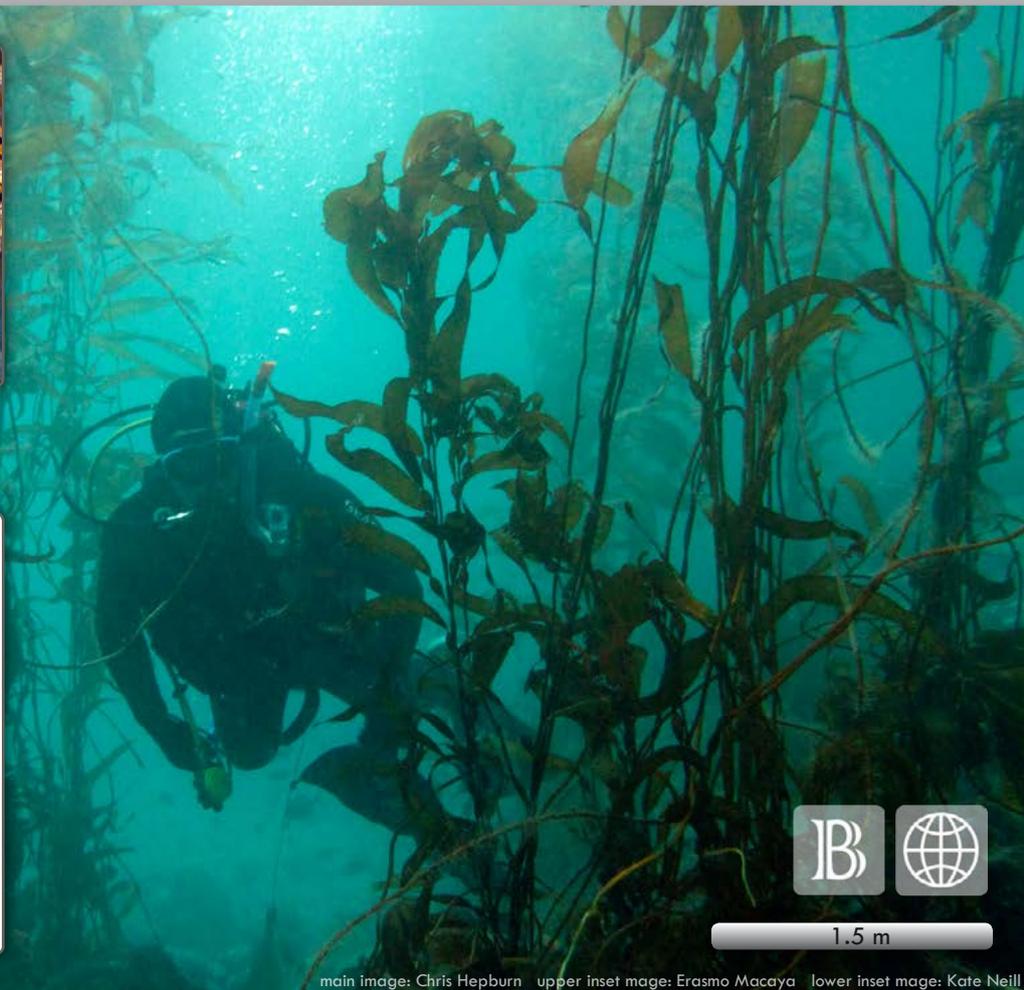
Plants grow up to 1 m high and consist of a large blade, often deeply divided into lobes. Blades have a well defined midrib which continues into the stalk. Holdfast of forked finger-like branches. Pale golden brown to dark brown. Reproductive structure (the sporophyll) varies in size and is found at the base of the stalk. It is thicker and often darker brown than the blades, and deeply folded and when big appears to spiral around the stalk.

Found in the low intertidal to subtidal growing on any hard surface, including concrete and wood. Introduced to New Zealand. Presently found around the North Island, South, Stewart, Chatham and Snares Islands. Native to Japan, Korea and China. Also invasive in Australia, Argentina, Britain, France, Italy, North America and Spain.

It could also be.....
Ecklonia radiata



Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.
 Uwai, S., Nelson, W., Neill, K., Wang, W.D., Aguilar-Rosas, L.E. Boo, S.M., Kitayama, T., Kawai, H. (2006) Genetic diversity in *Undaria pinnatifida* (Laminariales, Phaeophyceae) deduced from mitochondria genes – origins and succession of introduced populations. *Phycologia*, 45, 687–695.



1.5 m

main image: Chris Hepburn upper inset mage: Erasmo Macaya lower inset mage: Kate Neill

morphology



substrate

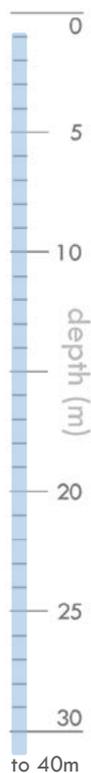


habitat



Plants can be huge, growing up to 20 m high. Consist of long cylindrical stipes that carry the blades up towards the surface of the water. Blades are long and leaf-like, wrinkled with small teeth on the edges and an oval bladder at the base. Blades grow from an area near the top of the plant where they split off sequentially. Holdfast of intertwined cylindrical haptera forming a massive dome-shaped structure. Golden brown. Reproductive structures occur as darker patches on smooth blades that have no air bladders.

Found in the subtidal on open coasts but sheltered from direct wave action. Found around southern North Island, South, Chatham, Stewart, Bounty, Antipodes, Auckland and Campbell Islands. Widespread in temperate waters.

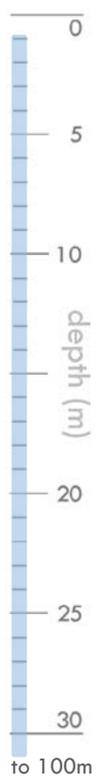




10 cm

main image: Malcom Francis inset image: Svenja Heesch

morphology	substrate	habitat	



Plants grow to 1 m high and consist of a large blade, deeply divided into lobes. Blades may be smooth or wrinkled. Stipe is cylindrical and unbranched. Holdfast made up of finger-like cylindrical branches or haptera. Golden brown. Reproductive structures occur as patches on the lobes of the blade and are visible as darker areas.

Found in the low intertidal to subtidal on moderately exposed or exposed coasts, sometimes forms large beds around Three Kings, North, South, Stewart and Snares Islands. Absent from the Chatham Islands but found on Mernoo Bank, 200 km east of the South Island. Also known from Australia, South Africa, Madagascar, West Africa and Oman.

It could also be.....
Undaria pinnatifida



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Laminariales Family Lessoniaceae



15 cm

Image: Tracy Fr

morphology	substrate	habitat



Plants grow up to 1m high and consist of long, strap-like blades that are smooth and glossy, growing from branches and stems that are cylindrical to flattened. Holdfast with flattened and lobed finger-like branches. Golden to greenish brown. Reproductive structures occur as patches on the blades and are visible as darker areas.

Found in the subtidal on open coasts. Endemic to the Chatham Islands.



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.



20 cm

main image: Roberta D'Archino inset image: Kate Neill



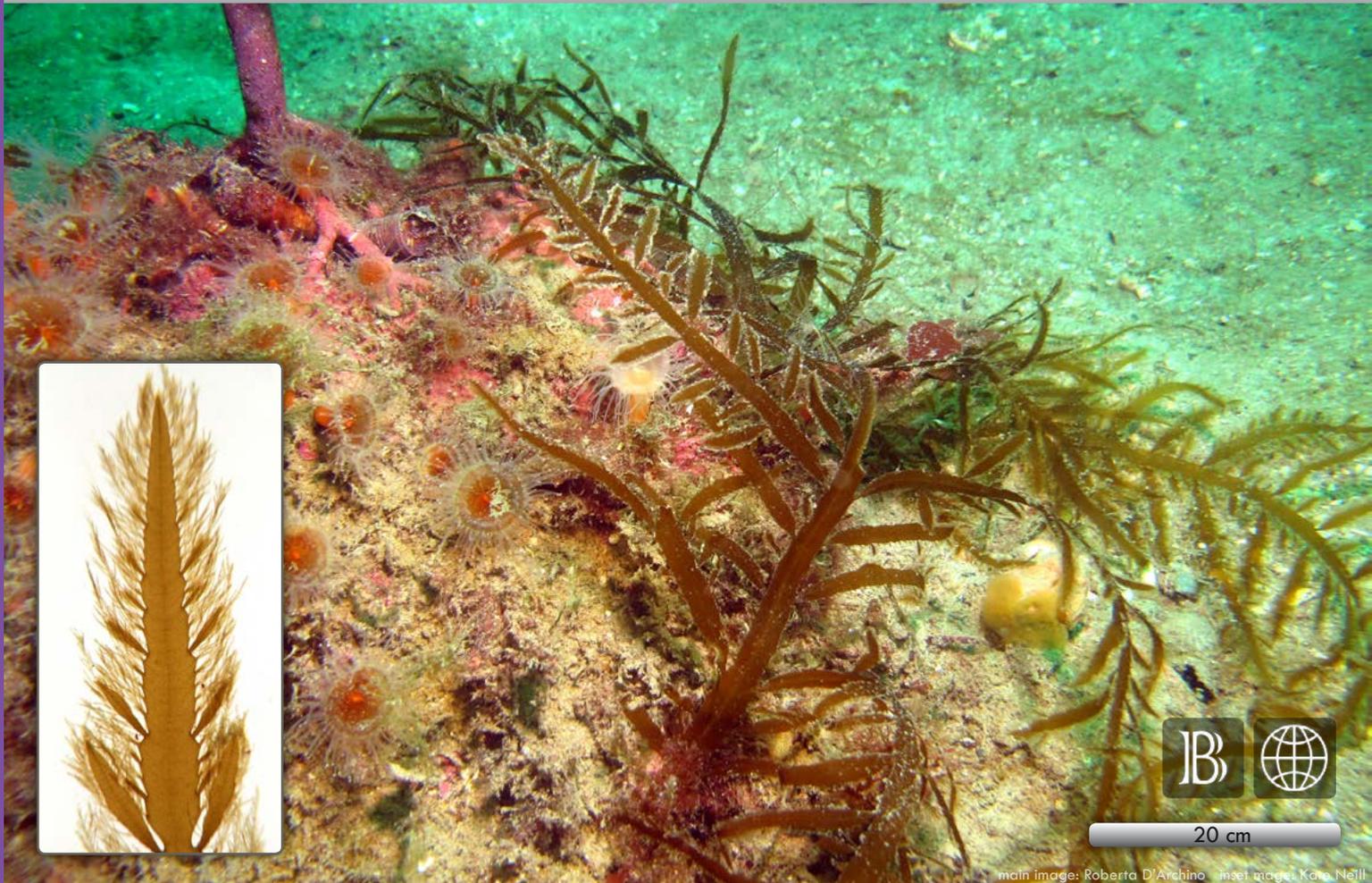
Plants are up to 1m high and consist of long strap-like blades with widely spaced marginal teeth. Blades grow from forked branches and stems that are tough and flattened. Holdfast rigid and buttressed. Golden brown to light brown. Reproductive structures occur as patches on the blades and are visible as darker areas.

Found in the upper subtidal to deepwater on exposed coasts around North, South and Stewart Islands.



Adams, N.M. (1994) *Seaweeds of New Zealand: An illustrated guide*. Canterbury University Press, Christchurch, 360 pp.
 Nelson, W. (2013) *New Zealand seaweeds. An illustrated guide*. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Desmarestiales Family Desmarestiaceae



20 cm

main image: Roberta D'Archino inset image: Kara Neill

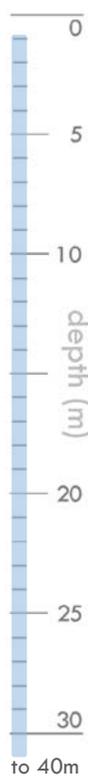
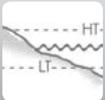
morphology



substrate



habitat



Plants grow up to 1 m high and consist of long ribbon-like blades with a midrib and similar secondary blades growing from the edges. Young blades may appear to be fringed with hairs. Stem is very short and cylindrical and expands into the blade. Attached by small holdfast disc. Golden brown, or green when detached and drifting. Reproductive structures are buried in the surface of the blades and are not easily visible. Plants release acid when they are breaking down and can etch rock.

Found in the low intertidal to subtidal on open coasts around Three Kings Islands, southern North, South, Chatham, Stewart, Snares, Bounty, Antipodes, Auckland and Campbell Islands. Also known from southern Australia, Korea, Japan, South and North America, northern Africa and Europe.



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.

Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.

Class Phaeophyceae Order Scytothamiales Family Splachnidiaceae

Dead man's fingers



8 cm

Images: Erasmo Macaya

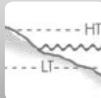
morphology



substrate



habitat



Plants grow up to 20 cm high and consist of swollen, blunt-tipped stems and side branches. Older branches can look leathery rather than swollen. Branches are filled with clear, jelly-like material. Holdfast is a small disc. Golden to mid brown. Reproductive structures are visible as small holes in the surface of the branches.

Found in the intertidal on moderate to exposed coasts around North, South, Stewart and Chatham Islands. Also known from Australia, South Africa and Juan Fernández Islands.



Adams, N.M. (1994) Seaweeds of New Zealand: An illustrated guide. Canterbury University Press, Christchurch, 360 pp.
Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.



images: Kate Neill

morphology



substrate



habitat

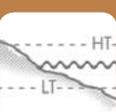


Plants grow to 30 cm high and are shrub-like, irregularly and densely branched, giving a bushy and sometimes scruffy appearance. Main branches are flattened to cylindrical with pointed tips. Holdfast is a small disc. Dull grey to khaki brown, or black when dry. Reproductive structures are buried in the surface of the blades but are not easily visible.

Found in the mid-intertidal in areas of moderate exposure around North, South, Stewart and Chatham Islands. Also known from Australia and Chile.



icons

body plan		brown seaweeds	marine macroalgae with photosynthetic pigments that result in their brown colour, and give rise to their common name (brown seaweeds, Phylum Ochrophyta). Includes the largest species on shorelines, forming kelp forests in rocky areas
life history		antipodean	naturally occurring around New Zealand and Australia only
		introduced	species naturally occurring outside of New Zealand waters and is found in New Zealand, invasive
		native	naturally occurring around New Zealand, endemic
morphology		bladders	inflated, hollow, or jelly-filled, flexible chamber
		bladed	flattened or sheet-like thallus; may be simple, divided, or include multiple blades
surface		leathery	thick skin, tough, flexible, slightly elastic
	substrate		artificial substratum
		living organism	living or growing on the external surface of an animal (epizoic) or seaweed, (epiphytic)
		rock	hard substrate such as mudstone, sandstone, basalt, compressed carbonates
habitat		algal beds	coralline algae, seagrass or algal beds
		intertidal	exposed shoreline zone between high and low tides, including rock flats, pools, overhangs, crevices, organisms exposed to wave action, temperature extremes, full illumination, and desiccation
habitat		wall	underwater cliffs and slopes, organisms exposed to wave surge and currents, and subdued illumination
		subtidal	exposed shoreline zone between high and low tides, including rock flats, pools, overhangs, crevices, organisms exposed to wave action, temperature extremes, full illumination, and desiccation
habitat		southern hemisphere	species recorded across the globe but restricted to the southern hemisphere only
		widespread	species recorded globally
morphology		shrub-like	bushy, composed of numerous branches and branchlets that emerge from a central stem
		strap-like	composed of flattened, elongate, branches that are longer than they are wide
substrate		rockpool	indentation in rock filled with water, intertidal
		rubble	shell, stone, and pebble rubble

glossary

agar	a compound produced from red seaweeds and used in food and to make the agar plates commonly used in laboratories
algal beds	areas of seafloor with coralline algae, sea-grass or multiple seaweed species
alginates	compounds found in the cell walls of brown algae and used as emulsifiers or stabilisers in various industries
artificial substratum	anything man-made such as mooring blocks, mussel lines, wharf piles
antipodean	naturally occurring in New Zealand and Australia, and may include seamounts and ridges to the north
blade	seaweed blades range from a single sheet-like structure through to finely divided 'leaves'
dendritic	branching, tree-like
diameter	the distance across the widest point of a circle
endemic	naturally occurring in New Zealand, but not elsewhere
environment	physical, chemical, ecological, behavioural and other conditions experienced by an organism
epiphytic	living or growing on the external surface of a plant
gametophyte	a phase in the life-cycle of those algae that undergo alternation of generations; the stage that produces gametes
gametes	male and female cells involved in sexual reproduction
gelatinous	jelly-like, slippery
habitat	the environment and local situation in which an organism lives
haptera	finger-like outgrowths from the base of the stipe/stem that serve as attachment points to the substrate
hard	solid to the touch, not compressible, rigid
interstices	the gaps and spaces between things, e.g. rocks, sand-grains or seaweed holdfasts
intertidal	exposed shoreline zone between high and low tides, including rock flats, pools, overhangs, crevices; organisms that live there are exposed to wave action, temperature extremes, full illumination, and desiccation
introduced	species first described beyond New Zealand waters, now occurring in New Zealand and other locations, invasive, adventive
leathery	thick, tough, flexible, slightly elastic
margins	edge of a surface
meandering	wandering along and above substratum attached at intervals, repent
midrib	a raised rib or strengthened vein-like area along the mid line of leaf-like blades
morphology	form and structure, shape
native	naturally occurring in New Zealand, but may also occur naturally elsewhere, endemic
range	extension since first described in New Zealand, this species has been recorded elsewhere
refuge	safe place to hide from predators
rock	hard substratum such as mudstone, sandstone, basalt, compressed carbonates
rock pool	excavation in rock, filled with water, in the intertidal zone
rough	irregularly pitted and ridged surface, often tough
sand	small coarse grains of worn silica, rock, and shell
seabed	composed of a variety of sedimentary substrata including coarse gravels, shell hash and sands to finer sand, mud, and silts; associated organisms are susceptible to inundation and scouring from wave surge and currents, and subdued illumination
sinuous	wavy pattern
smooth	even, hairless, silky, can be slightly undulating
soft	easily compressible, elastic
sporophyll	a modified blade for spore-bearing
stipe	the stem-like region between the holdfast and blade of a seaweed
subtidal	zone below the low tide, including rock flats, slopes, walls, crevices, overhangs, boulder fields; associated organisms are exposed to wave surge, currents and subdued illumination
thallus	the entire structure of a seaweed; generally comprised of a holdfast, stipe/stem and blade/s
wall	underwater cliff or slope; associated organisms are exposed to wave surge, currents and subdued illumination
warty	bearing small flattened bumps or tubercles
widespread	species recorded globally
zygote	a cell that is formed when female and male gametes combine

acknowledgements

Thanks to the many talented photographers whose work was used with permission in our guide, including: Erasmo Macaya (Universidad de Concepción, Chile), Chris Hepburn (University of Otago), Lou Hunt (Ministry for the Environment), Kendall Clements (University of Auckland), Jenn Dalen (Te Papa), Roberta D'Archino, Tracy Farr, Malcolm Francis, Svenja Heesch, Sheryl Miller (all NIWA or ex-NIWA). The preparation of this guide was funded by NIWA under Coasts and Oceans Research Programme 2 Marine Biological Resources: Discovery and definition of the marine biota of New Zealand (2015/2016 SCI).

further reading

- Adams, N.M. (1994) Seaweeds of New Zealand. An illustrated guide. Canterbury University Press, Christchurch. 360 pp.
- Brown, M.T., Nyman, M.A., Keogh, J.A., Chin, N.K.M. (1997) Seasonal growth of the giant kelp *Macrocystis pyrifera* in New Zealand. *Marine Biology*, 129, 417–424.
- Choat, J.H., Schiel, D.R. (1982) Patterns of distribution and abundance of large brown algae and invertebrate herbivores in subtidal regions of northern New Zealand. *Journal of Experimental Marine Biology and Ecology*, 60, 129–162.
- Cole, R.G., Babcock, R.C., Travers, V., Creese, R.G. (2001) Distributional expansion of *Carpophyllum flexuosum* onto wave-exposed reefs in north-eastern New Zealand. *New Zealand Journal of Marine and Freshwater Research*, 35, 17–32.
- Dean, P.R., Hurd, C.L. (2007) Seasonal growth, erosion rates, and nitrogen and photosynthetic ecophysiology of *Undaria pinnatifida* (Heterokontophyta) in southern New Zealand. *Journal of Phycology*, 43, 1138–1148.
- Forrest, B.M., Brown, S.N., Taylor, M.D., Hurd, C.L., Hay, C.M. (2000). The role of natural dispersal mechanisms in the spread of *Undaria pinnatifida* (Laminariales, Phaeophyceae). *Phycologia*, 39, 547–553.
- Fraser, C.I., Spencer, H.G., Waters, J.M. (2012) *Durvillaea poha* sp. nov. (Fucales, Phaeophyceae): a buoyant southern bull-kelp species endemic to New Zealand. *Phycologia*, 51(2), 151–156.
- Gillanders, B.M., Brown, M.T. (1994) Seasonal variation in standing crop, reproduction and population structure of *Xiphophora gladiata* (Phaeophyceae: Fucales). *Botanica Marina*, 37, 35–41.
- Guiry, M.D., Guiry, G.M. (2015) AlgaeBase. World-wide electronic publication, National University of Ireland, Galway. <http://www.algaebase.org>; searched on 06 August 2015.
- Hay, C.H. (1979a) Some factors affecting the upper limit of the southern bull kelp *Durvillaea antarctica* (Chamisso) Hariot on two New Zealand shores. *Journal of the Royal Society of New Zealand*, 9, 279–289.
- Hay, C.H. (1979b) Growth, mortality, longevity and standing crop of *Durvillaea antarctica* (Phaeophyceae) in New Zealand. *Proceedings of the International Seaweed Symposium 9*, 97–103. Science Press, Princeton.
- Hay, C.H. (1989) *Lessonia tholiformis* sp. nov. (Phaeophyta: Laminariales) from the Chatham Islands, New Zealand. *New Zealand Journal of Botany*, 27, 461–469.
- Hay, C.H. (1990a) The dispersal of sporophytes of *Undaria pinnatifida* by coastal shipping in New Zealand and the implication for further dispersal on *Undaria* in France. *British Phycological Journal*, 25, 301–313.
- Hay, C.H. (1990b) The distribution of *Macrocystis* (Phaeophyta: Laminariales) as a biological indicator of cool sea surface temperature, with special reference to New Zealand. *Journal of the Royal Society of New Zealand*, 20, 313–336.
- Hay, C.H., Luckens, P.A. (1987) The Asian kelp *Undaria pinnatifida* (Phaeophyta: Laminariales) found in a New Zealand harbour. *New Zealand Journal of Botany*, 25, 329–332.
- Hay, C.H., South, G.R. (1979) Experimental ecology with particular reference to proposed commercial harvesting of *Durvillaea* (Phaeophyta, Durvilleales) in New Zealand. *Botanica Marina*, 22, 431–436.
- Hay, C.H., Villouta, E. (1993) Seasonality of the adventive Asian kelp *Undaria pinnatifida* in New Zealand. *Botanica Marina*, 36, 461–476.
- Hurd, C.L., Nelson, W.A., Falshaw, R., Neill, K.F. (2004) History, current status and future of marine macroalgal research in New Zealand: Taxonomy, ecology, physiology and human uses. *Phycological Research*, 52, 80–106.
- Miller, S.M., Hurd, C.L., Wing, S.R. (2011) Variations in growth, erosion, productivity, and morphology of *Ecklonia radiata* (Alariaceae; Laminariales) along a fjord in southern New Zealand. *Journal of Phycology*, 47(3), 505–516.
- Nelson, W. (2013) New Zealand seaweeds. An illustrated guide. Te Papa Press, Wellington, 328 pp.
- Hepburn, C.D., Hurd, C.L. (2005) Conditional mutualism between the giant kelp *Macrocystis pyrifera* and colonial epifauna. *Marine Ecology Progress Series*, 302, 37–48.
- Kain, J.M. (1982) Morphology and growth of the giant kelp *Macrocystis pyrifera* in New Zealand and California. *Marine Biology*, 67, 143–157.
- Nelson, W.A. (1994) Distribution of macroalgae in New Zealand - an archipelago in space and time. *Botanica Marina*, 37, 221–233.

- Schiel, D.R., Foster, M.S. (2015). The biology and ecology of giant kelp forests. University of California Press, Oakland. 416 pp.
- Stevens, C.L., Hurd, C.L., Smith, M.J. (2002). Field measurements of the dynamics of the bull kelp *Durvillaea antarctica* (Chamisso) Heriot. *Journal of Experimental Marine Biology and Ecology*, 269, 147–171.
- Taylor, D.I. and Schiel D.R. (2010) Wave-related mortality in zygotes of habitat-forming algae from different exposures in southern New Zealand: the importance of 'stickability'. *Journal of Experimental Marine Biology and Ecology*, 290, 229–245.
- Uwai, S., Nelson, W., Neill, K., Wang, W.D., Aguilar-Rosas, L.E. Boo, S.M., Kitayama, T., Kawai, H. (2006) Genetic diversity in *Undaria pinnatifida* (Laminariales, Phaeophyceae) deduced from mitochondria genes – origins and succession of introduced populations. *Phycologia*, 45, 687–695.
- Womersley, H.B.S. (1987) The marine benthic flora of southern Australia. Part II. Government Printer, South Australia, Adelaide. 484 pp.

