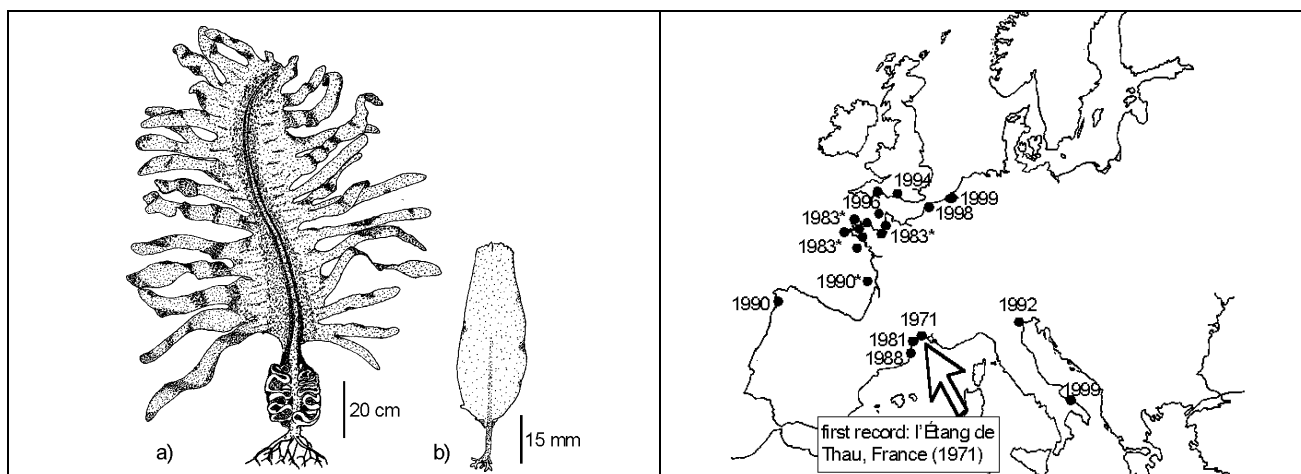


Marine Brown Seaweed: *Undaria pinnatifida* (Harvey) Suringar, Laminariales, Phaeophyceae
Common names: Wakame (Japanese, also used in other languages), Japanese kelp (English)



Undaria pinnatifida. a) Mature plant, b) young specimen (after photos of WALLENTINUS).

Known coastal distribution of *Undaria pinnatifida*.
*: Brought for cultivation.

Impact: (* = possibly harmful, ** = harmful, *** = very harmful, ? = not known, \$ = beneficial)

Resources/Environment			Uses of the Sea		
Commercial stocks	\$	Commercially harvested or farmed in some areas.	Fisheries	*	Canopy hinder fishermen spotting abalone.
Other biota	* or \$	Competing with other seaweeds. Eaten by many grazing animals.	Aquaculture	** or \$	Fouling on lines, cages, also growing on molluscs or competing for space. Used to feed abalone.
Human health	\$	Nutritional value when eaten.	Water abstractions	?	May grow on openings of water intakes.
Water quality	\$	Take up nutrients (as all plants) which are removed if harvested.	Aquatic transport	**	Fouling on boats, buoys etc., including costs for cleaning.
Habitat modification	* or \$	Large canopies change habitat, reduce light and water movements. Provide shelter for animals.	Tourism	*	Detached plants can accumulate on beaches (also native species do).

Vulnerable habitats: Especially areas not densely covered by other seaweeds, if not too exposed, harbours, marinas or aquaculture sites. If salinities are high enough (generally above 27 ‰) it may become established in all warm and most cold temperate areas of the world. Easily spread by fouling on boats especially when moored for long periods, by cleaning of hulls or by drifting objects. May survive also on trailed boats as microscopic gametophytes standing darkness for months and very tolerant to drying out and to high and low temperatures. Spread by movements of molluscs.

Biology: The life cycle consists of two stages. A large (ca. 0.5-3 m) annual sporophyte with a lobed lamina and an evident midrib (different morphological forms exist) is attached by root-like hapteres to rock, stone, wood, shells, tunicates or sometimes plants and also to most artificial substrates (ropes, boats, buoys, pontoons, concrete, plastic, glass etc.). Undulated winglike sporophylls at the basal part (stipe) of the plant produce zoospores (can be several millions from one plant) which grow into microscopic (only a few cells each) separate female and male gametophytes, not possible to see in the field nor to separate from other kelps. After fertilization of the eggs in oogonia at the top of the female gametophytes, new sporophytes grow out within some weeks, the time to maturity depending on temperature and light. In the native and most other areas recruitment occurs once a year while some of the introduced populations have successive year round generations. Old plants lose the blade before they die and in most areas plants disappear during the end of summer. Like all seaweeds they need light to carry out photosynthesis and take up nutrients by the entire thallus surface.