



Photo: Bill Merilees

Varnish Clams

Background

Varnish clams (*Nuttallia obscurata*) are a relatively recent addition to the fauna of British Columbia. They arrived in the early 1990's, possibly introduced as larvae in ballast water from trans-oceanic transport vessels.

Varnish clams have a thick, shiny brown periostracum on the outside of the shells. The inside of the shells is purple. The hinge ligament is external and large. The body, mantle and siphons are white. The siphons are long, and split for their entire length.

Varnish clams are well established in Georgia Strait and Barkley Sound and are slowly dispersing southward into Puget Sound and northward on both coasts of Vancouver Island (Fig. 1). Live animals have been collected as far north as Clayoquot Sound on the west coast of Vancouver Island and Cameleon Harbour from inside waters. Additional shell records have been collected from Checleset Bay and Salmon Bay on Vancouver Island and Toba Inlet on the B.C. mainland. Varnish clams have been found in several estuaries in coastal Oregon.

Varnish clams are found relatively high in the intertidal zone of sand/gravel beaches, particularly areas of loose sand. They are often found in association with streams, freshwater runoff or groundwater seepage. Where their distribution overlaps that of Manila and littleneck clams, they are generally found deeper in the substrate than other species.

Varnish clams grow to at least 69 mm total length, and a maximum weight of approximately 61 g.



Figure 1: Known distribution (shaded area) of the varnish clam in North America.

Summary

- Varnish clams have been recently introduced and are found throughout Georgia Strait, portions of the west coast of Vancouver Island and areas of Washington and Oregon States.
- There is relatively little information available on varnish clam biology or population dynamics.
- Results of competition studies show competition between varnish and Manila clams, with varnish clams having the competitive advantage in the high intertidal, and Manila clams in the mid intertidal.
- Relative distribution studies indicated that varnish clams are held to the upper intertidal zone when moderate densities of manila clams were present, but varnish clams inhabit the entire intertidal zone in the absence of other clam species. It is not clear at this time whether these observations are due to competitive effects or habitat differences.
- Varnish clams may represent an opportunity to diversify production from both the intertidal clam fishery and aquaculture tenures.

- Processing requirements for varnish clams differ from other species but can be conducted economically.

Species Biology

Varnish clams are synchronous broadcast spawners, with pelagic larvae. Seasonality of spawning, larval period duration and season of settlement are unknown in the northeastern Pacific. However, work is currently being conducted to determine reproductive characteristics of varnish clams in British Columbia.

Varnish clams are capable of filter-feeding, selectively removing food particles from the water column. They also utilize pedal feeding, collecting organic detritus from the sediment using the foot.

Little is known about age and growth of varnish clams, but there is evidence that they may grow at rates similar to Manila clams, *Venerupis philippinarum*, achieving 38 mm in length in about four years. Size and age at maturity are not known but is currently being investigated.

Anecdotal and survey information indicate that varnish clams have established fairly large populations on most beaches in Georgia Strait in a relatively short time (< 10 yr).

Varnish clams are typically found associated with Manila, littleneck (*Protothaca staminea*), softshell (*Mya arenaria*), and *Macoma* clams. They are host to pea crabs, *Pinnixia faba*, sometimes with relatively high infestation rates. These crabs are found in other intertidal clams, but generally mature only in horse clams, *Tresus capax*.

Varnish clams are preyed on by moonsnails (*Euspira lewisi*), crabs, gulls, crows (*Corvus caurinus*) and oystercatchers (*Haematopus bachmani*).

The Fishery

Following resolution of public health concerns regarding risks associated with Paralytic Shellfish Poisoning (PSP) and coliform contamination by the Canadian Food Inspection Agency (CFIA), varnish clams were harvested on a small scale under experimental license. The purpose of the project was to collect biological data and test marketability. Studies included the documentation of harvesting techniques and processing methods, and experiments to examine competition between varnish and Manila clams.

Limited information gathered by the CFIA indicate that varnish clams accumulate and depurate PSP toxins at rates similar to Manila clams and Pacific oysters (*Crassostrea gigas*).

Limited landings of varnish clams were also harvested during an experimental opening in the wild commercial clam fishery in 2001 during which the retention of varnish clams was permitted.

The market name “Savoury Clam” has been registered with the CFIA for the purpose of an international marketing study. Results of the market study show interest from both Canadian and U.S. restaurant markets.

Varnish clams are fished recreationally, but effort, landings or relative importance in the recreational fishery is not known.

Industry Perspective

Intertidal clam fishers have expressed interest in developing varnish clams as a commercial resource. Aquaculturists have expressed interest in exploiting varnish clam production on tenured ground, and have concerns that varnish clams could affect production of Manila clams from aquaculture tenures. The ecological relationships of varnish and Manila clams has been explored. Results indicated there were competition effects, with varnish clams having the competitive advantage in the high intertidal and Manila clams in the mid-intertidal.

Resource Status

As with other intertidal clam species, varnish clams are known to be abundant on many beaches in Georgia Strait, although little quantitative information is available regarding resource status and potential productivity under harvested conditions. There are data that indicate that varnish clams are at least as abundant, and at times more abundant than Manila and native littleneck clams on many beaches.

Outlook

Pending continued market testing and development of fishery management plans, varnish clams may represent an opportunity to diversify production from both the intertidal clam fishery and aquaculture tenures.

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Management Considerations

Conservation objectives and management tactics are currently being developed for varnish clams. Because there appears to be potential as a commercial resource, development of varnish clam fisheries will proceed in a precautionary manner. The rate of fishery development will be dependent on the time required to develop information to rationally manage the fishery and the time to develop a market.

It is not known whether the size limit of 38 mm currently enforced for Manila and littlenecks would enable varnish clams to spawn at least once before entering the fishery. When varnish clams live in association with Manila clams, varnish clams cannot be harvested without displacing, and possibly adversely affecting Manila clams. Opportunities to harvest varnish clams may be limited to situations where they are available in the absence of Manila clams, or where conservation thresholds for Manila clams have not been achieved and the two species can be harvested simultaneously.

References

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