

Karampelas, S., Fritsch, E., Notari, F. (2008) Update on natural pearls of Veneridae family, *Gems and Gemology*, vol. 44, N°4, pp. 374 - 375.

**Natural pearls of the Veneridae family.** The best-known natural pearls from bivalves of the Veneridae (classified by Rafinesque, 1815) family are those from *Mercenaria mercenaria* (Linnaeus, 1758), also known as “quahog” pearls from the mollusk’s common name, northern quahog. These non-nacreous pearls range from “cream” white to brown, and from faint pinkish purple to dark purple, though some are pure white (e.g., figure 13). Like other natural pearls, quahog pearls are seldom perfectly round; in rare cases, circled quahog pearls occur (figure 14). *M. mercenaria* bivalves are found along the Atlantic coast of North America to the Yucatan Peninsula. The species also has been introduced along California’s Pacific coast.

However, *M. mercenaria* is not the only mollusk of the *Mercenaria* genus to produce pearls. White, “cream,” and sometimes brown non-nacreous pearls can be found in another species belonging to the same genus, *M. campechiensis* (Gmelin, 1791), or southern quahog. This species is found in the southern part of the *M. mercenaria* distribution area. *M. campechiensis* is slightly larger than *M. mercenaria*, and its interior surface lacks purple coloration; thus, it cannot produce purple pearls.

Nor are *Mercenaria* bivalves the only mollusks of the

Veneridae family that can produce beautiful pearls. In the Fall 2001 GNI section (p. 233), one of these contributors (EF) described an almost perfectly round purple pearl found along the coast of France in a mollusk from the *Venerupis* genus (Lamarck, 1818), *V. affinis decussata* (Linnaeus, 1758). This mollusk (known as “palourde” in French) is commonly harvested for its meat, which is considered a delicacy.

The interiors of *M. mercenaria* and *V. aff. decussata* shells, as well as the pearls associated with them, are similar in appearance (figure 15). The purple color is present at the shell margins, mainly around the muscle scars. Both pearls and shells display the same medium chalky whitish yellow fluorescence to long- and short-wave UV radiation, though it is weaker for the *V. aff. decussata*.

Raman spectroscopy of the samples in figure 13 (left

*Figure 13. These two photos illustrate natural “quahog” pearls from the M. mercenaria mollusk. The white button-shaped sample (left image, far left) is ~10.5 × 7.8 mm (8.17 ct), and the brown button-shaped pearl in the right image is ~9.3 × 7.5 mm (5.03 ct). Courtesy of P. Lançon, Geneva; photos by Thomas Notari.*





Figure 14. Note in these four baroque quahog (*M. mercenaria*) pearls that color variation in the bicolored samples is distributed along the pearls' rotational axis. All are circled except the second sample from the left, but its ovoid shape is still probably due to pearl rotation during formation. The bicolored sample on the left is  $\sim 13.2 \times 11.2$  mm (11.62 ct). Courtesy of P. Lançon, Geneva; photo by Thomas Notari.

image) and figure 14, using 488, 514, and 561 nm laser excitations, showed that the purple color was due to a mixture of unsubstituted polyenic (polyacetylenic) compounds (figure 16). To our knowledge, the origin of the purple color of Veneridae pearls and/or inner shells has not been previously reported. Similar pigments have been

Figure 16. These Raman spectra for a purple quahog (*M. mercenaria*) pearl were taken at laser excitations of 488, 514, and 561 nm. In the region most "sensitive" to C=C stretching bonds (about  $1500\text{ cm}^{-1}$ , see inset), variations in the position, shape, and relative intensities of the peaks are quite apparent. This suggests that the purple color is due to a mixture of unsubstituted polyenic (polyacetylenic) compounds and not to a single pigment. Raman spectra on colored samples from *V. aff. decussata* showed the same peaks. All the peaks are normalized to the main aragonite peak at  $1086\text{ cm}^{-1}$ . The spectra are offset vertically for clarity.

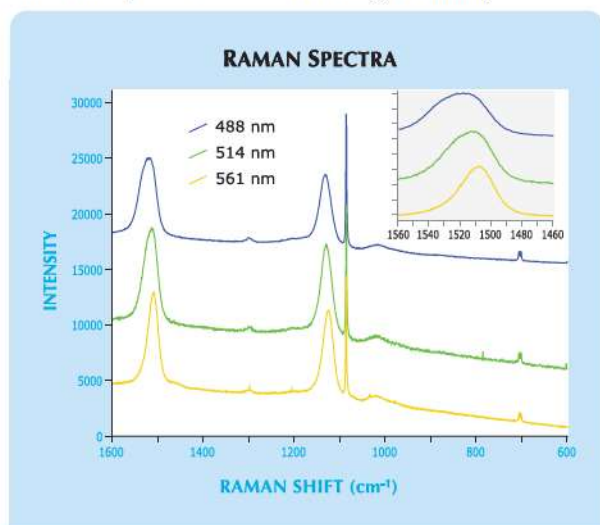


Figure 15. Though *V. aff. decussata* (inner shell, 4.5 cm) is found on the western coast of France and *M. mercenaria* (9.5 cm, courtesy of Antoinette Matlins, South Woodstock, Vermont) is found on the North American Atlantic coast, the two exhibit similar coloration. Photo by S. Karampelas.

observed in freshwater cultured pearls (S. Karampelas et al., "Identification of pigments in freshwater cultured pearls with Raman scattering," Fall 2006 *Gems & Gemology*, pp. 99–100).

*M. mercenaria* can reach 12 cm in diameter, while *V. aff. decussata* mollusks from the west coast of France do not exceed 7.5 cm. Thus, the latter mollusks produce smaller pearls (rarely up to 6 mm) compared to those from *M. mercenaria* (rarely up to 12 mm). It should be noted that "gem-quality" natural pearls from *V. aff. decussata* have been documented only once, whereas there have been numerous reports of gem-quality quahog pearls.

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