

Past and present situation of freshwater pearls from North Western Russia

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Introduction

Freshwater pearls from *Margaritifera margaritifera* (L., 1758), also called the „European pearl mussel“, are part of European cultural history. The mussels originally ranged from the north-western Iberian Peninsula to north-western Russia but significant pearl production occurred only in a few countries, such as parts of Germany (especially Bavaria and Saxony), Great Britain (especially Scotland) and Russia. During the last century, populations have diminished by more than 90%, due to environmental influences and the species is listed as endangered on the IUCN Red List since 1996.

In north-western Russia, particularly from the 18th and 19th centuries until 1917, the pearls were used abundantly for both secular and ecclesiastical purposes and commonly incorporated into embroideries, traditional headdresses, jewellery and various objects of religious significance.

Interest in pearls waned after the Russian Revolution, and interviews conducted during the 2000s with people in former pearling centres in Karelia and on the Kola Peninsula showed that local knowledge about pearls has nearly disappeared, and only a few items have been preserved at local museums.

Distribution of the pearl mussel in north-western Russia

The occurrence of *Margaritifera margaritifera* is confined to the northern hemisphere, situated between approximately 40° and 70° northern latitude. The mussel has a high life expectancy of 200+ years and needs clean, summer-cool waters with high oxygen and low nutrient and Ca contents. It requires for its parasitic glochidial (larval) stage a host fish that is exclusively of the genus *Salmo*, in central Europe it is the brown trout (*Salmo trutta fario*) and in western and northern Europe it is the Atlantic salmon (*Salmo salar*).

Originally, the pearl mussel occurred in a wide area of north-western Russia that stretched from Lithuania in the west to the slopes of the Ural Mountains in the east and from the tributaries of the Don and Volga Rivers in the south to the White Sea in the north. The mussels formerly were especially abundant in rivers and streams flowing into the White Sea (Fig. 1). Today, large populations of ca. 6 and ca. 140 million mussels, respectively, remain only in the Keret River in Karelia and the Varzuga River on the Kola Peninsula (Makhrov et al., 2014). In 1985, harvesting of pearl mussels was completely prohibited and today the species is listed as endangered in the *Red Data Book of the Russian Federation* (Strack, 2015).

The history of pearl usage in Russia

The use of freshwater pearls for decoration and adornment in north-western Russia goes back to the Middle Ages. Pearls came into fashion towards the end of the 18th century, and this lasted until the end of the Russian empire under the Romanoff dynasty in 1917 (Korago, 1981). Traditional festive dresses were embroidered with pearls which also were used to embellish kokoshniks, often in combination with pearl necklaces and pearl earrings. Since the 10th century, pearls were used in the Russian Orthodox Church for embroidering chasubles and antependia and for decorating chalices, book covers, crosses, mitres and icons

Pearling centres developed along the Dvina River near the city of Arkhangelsk, on the Keret and Kem Rivers in Karelia and on the Kola Peninsula, particularly near the Umba and Varzuga Rivers (Fig. 1). Apart from the villages, where local women did the craftwork, professional workshops opened up in some cities. The city of Kem, founded in 1783 and situated on the White Sea was important, as was the small city of Olonez, capital of a governorate with the same name, situated near Lake Ladoga (Fig. 1).

The first two decades of the Soviet era (1922-1991) saw a decline that went hand in hand with a decline in mussel populations due to pollution by various industries. Moreover, the new political system led to an increasing lack of interest as those who had appreciated pearls in the past no longer existed and the Church had lost its function. Interest in pearls decreased further in the decades after World War II.

Field Research

The Russian Museum of Ethnography in St Petersburg hosts today the most exquisite collection of pearl works, followed by the Armoury Chamber of the Kremlin in Moscow, which focuses on ecclesiastical treasures. Both collections were visited in 1998.

In order to get further on-site information, several visits in 2001, 2006 and 2008 to the former pearling centres in Karelia (Keret Village, Kem, Olonez, Petrosavodsk and Archangelsk) and on the Kola Peninsula (Umba village, Varzuga and Kuzomen village) served to conduct interviews with local government, museum and church authorities and fisheries biologists. A number of elderly village citizens were also included. All those interviewed agreed that pearls were an item of the past, knowledge of which had disappeared in the Soviet era. Only rumours had remained of a pearl find made by a government delegation in 1974.

The small town of Umba and the city of Kem both host a museum on the history of pearling and both museums own a 19th century kokoshnik each, while museums in Petrosavodsk and Arkhangelsk have only collections of shells of *Margaritifera* species.

Three loose 20th century pearls from the Varzuga River were made available by Valery Ziuganov, a fisheries biologist who had worked at the salmon station in Varzuga village.

The Pearls – testing results

The kokoshnik at the Umba museum was examined on-site with the aid of a 10x lens and a UV-Lamp (366nm and 254nm), the small pearls could be identified as imitation pearls while the off-round pearls in sizes of up to 7mm, arranged in rosettes, are freshwater pearls (Fig. 2).

Several pearl items (a selection of earrings and necklaces, a kokoshnik and a belt) kept at the Ethnographic Museum in St. Petersburg, were examined on-site in 1998, with the help of a

UV-lamp and an optical microscope (magnification up to 80x). Pearl sizes range on average from 1-4mm, going up to 9mm, colours go from white to light „cream“ to light grey, a few pearls showed brown colours. Shapes included off-round, flat, barrel, button and baroque, flat areas often showed a wrinkled growth pattern and lustre is generally dull (Fig. 3).

The three loose pearls from the Varzuga River have barrel, drop and intergrown shapes, weighing 2.68 ct., 1.27 ct. and 1.83 ct. each. Measurements are in the range of 3-10mm, and colours are mainly greyish-brown with purplish tinges (Fig.4). Radiographs taken with a Kodak 2200 digital X-ray system (60-70 KV, 49 W), showed irregular and linear deposits of organic substance (Fig.5).

Conclusion

The European freshwater pearl mussel *Margaritifera margaritifera* has largely disappeared from its original distribution area in north-western Russia, only the Varzuga and Keret Rivers still hold large stocks. Listed as endangered in the IUCN Red List since 1996, fishing of the pearl mussel is prohibited in Russia since 1985. Moreover, field research has shown that local knowledge of pearls has waned in the decades since 1917, it is practically non-existent.

The limited number of pearl items available for study included 18th - 19th century objects from museums in St. Petersburg and Umba and three loose pearls from the Varzuga River, collected in the 20th century. Pearl sizes go from ca. 1 to 11mm, colours range from white to grey, some brownish hues are also present. Shapes include off-round, barrel, button and baroque, a wrinkled growth pattern on flat surfaces is characteristic. X-radiography of three loose 20th century pearls revealed irregular and linear deposits of organic substance.

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