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Press Release

For Immediate Release

SSEF releases laboratory alert on new, unstable treatment of conch pearls which results in surface damage

Basel, Switzerland -- September 9, 2013: The Swiss Gemmological Institute (SSEF) announced it has identified a previously unknown treatment of conch pearls (e.g. *Strombus gigas*) that seriously corrodes and damages the surface of such pearls. SSEF detected the treatment after running an extensive series of tests on a necklace containing surface corroded conch pearls. The research showed that the conch pearls were damaged by a new and unstable treatment (coating) that was applied on the surface. It seems the treatment damage is almost irreversible.

SSEF Director Dr. Michael S. Krzemnicki said a client had submitted a conch pearl necklace to determine what had caused the complete corrosion of the surface to some of the pearls. "The necklace's owner assured us that [since he bought the necklace] for the last few months these pearls had sat most of the time in his safe and had been worn only occasionally. He also said that the pearls had been handled carefully and been given the care as advised for pearls." "Obviously, the corrosion process and the ensuing damage caused to some of the pearls in the necklace, occurred while the pearls were in the safe," Krzemnicki noted. "When the owner removed them, some of the formerly perfect looking conch pearls showed a completely corroded surface (see Figure 1) which profoundly affects their lustre and colour, and their beauty," he continued.

Intriguingly, following a first, visual examination, it seemed that not all of the conch pearls in the necklace were affected by this surface alteration, Krzemnicki reported. A detailed microscopic study of this necklace revealed that even the conch pearls that at first glance seemed not to be affected, were in fact in the very early stage of surface alteration and would become similarly damaged in the course of time.

"For the pearls showing already visibly surface corrosion, we can distinguish several stages of alteration: from a slightly dull surface lustre to distinctly altered (whitened) surfaces and finally to conch pearls that are heavily encrusted with whitish precipitates (see Figures 1 and 2). Interestingly, the small seed pearls which are alternating with the damaged conch pearls show no alteration whatsoever on their nacreous surface (see also Fig. 2). This rules out 'normal' damage,' which could occur due to contact with acids such as perfume) during wear," Krzemnicki added.

Scanning electron microscopic (SEM) analyses of the conch pearls revealed that the conch pearls studied were coated (see Figure 3) by a carbon-rich layer (i.e. an artificial resin). "We

presume that the corrosion of the underlying conch surface is a consequence of the degassing of the coating. Additionally, this process in the end results in the precipitation of a whitish encrusting on the surface (see Figures 2 and 4). It seems that only a thorough reshaping and re-polishing can remove the damage on the conch pearl," the SSEF director declared.

The conch pearls which already show a corroded surface can be easily identified - even by the naked eye. Unfortunately, in the case of coated conch pearls that still have a "perfect" visual appearance this treatment is hardly discernible, even with the microscope! Occasionally, the coating may show some very small glue-like bulges at the surface. Brownish granular spots below the surface are a further microscopic indication of this unstable treatment. They represent in fact an early stage of corrosion at the interface between the coating and the underlying conch surface. The preferred identification method of this kind of treatment on conch pearls is Raman spectrometry. Here, the coated, but visually still "perfect", conch pearls display a very strong and characteristic broad luminescence band compared to untreated conch pearls.

So the question arises how the trade can protect itself against these treated conch pearls. "Naturally, at SSEF we have now added the testing protocol of treated conch pearl to our standard analytical procedures," Krzemnicki said. "On our SSEF test reports, we will be describing coated conch pearls as: '*Treated Conch Pearl*,' with an additional comment that says: '*Indications of surface coating. This coating is not stable and may deteriorate the conch surface in the course of time*'."

Krzemnicki said that the danger of this new and unstable conch treatment is that the described surface alteration may often occur only after such a treated conch necklace or similar expensive piece of jewelry has been sold to a private client and thus may heavily damage the confidence of the buyer in their pearls - and the trade itself.

"By clearly labelling this new and unstable treatment on our reports, we are determined to support the trade to take the necessary measures against this new threat and to prevent a further infiltration of these coated conch pearls into the market," Krzemnicki concluded.

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For further information and research findings about pearls and pearl treatments, please check our website <http://www.ssef.ch/research-publications/>. Please check also our SSEF Advanced Pearl Course (<http://www.ssef.ch/education/advanced-training-courses/pearls/>), focussing on identification of natural and cultured pearls and detection of pearl treatments.



Fig. 1: Necklace containing conch pearls, alternating with seed pearls and diamond briolettes. Part of the conch pearls show distinct whitish surface alterations due to chemical corrosion. © M.S. Krzemnicki, SSEF.



Fig. 2: Heavily damaged conch pearl with completely corroded surface and whitish precipitates on the surface. © M.S. Krzemnicki, SSEF

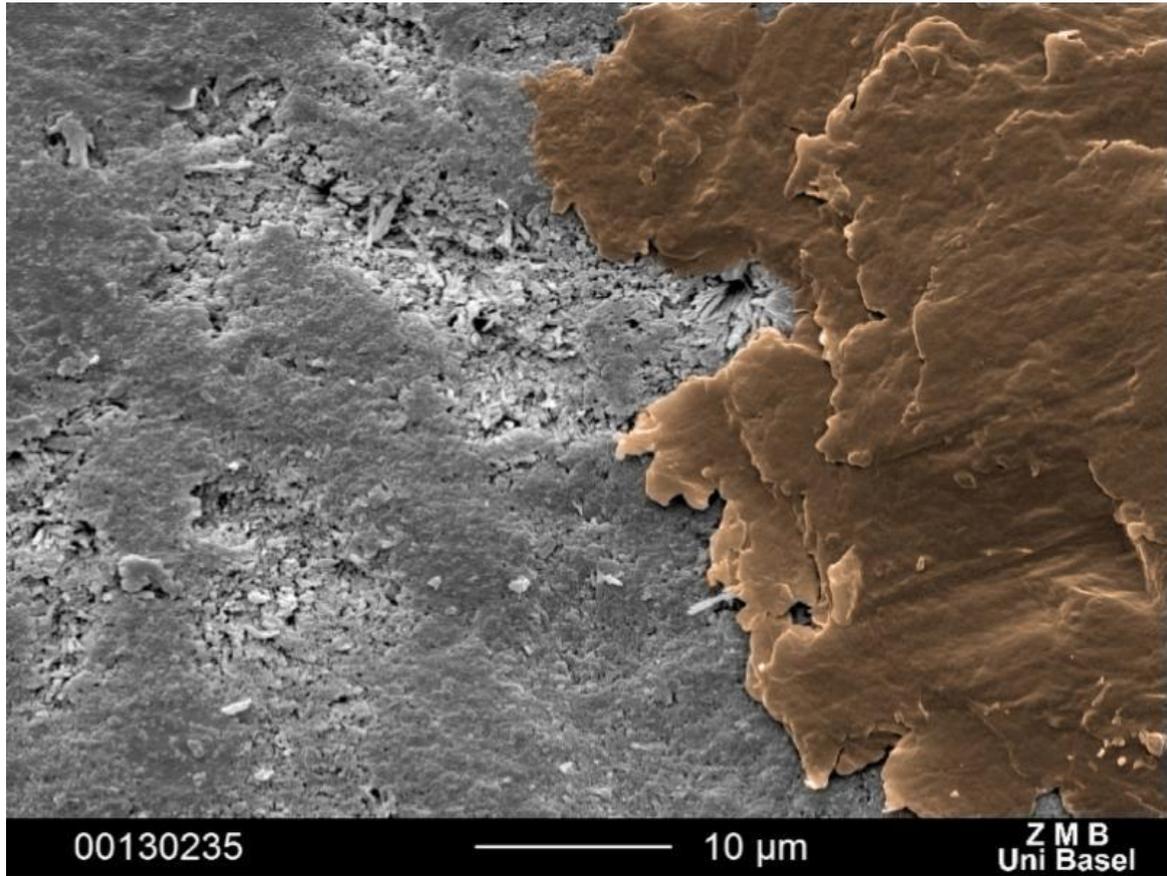


Fig. 3: Scanning electron micrograph (2000x magnification) of the surface of a corroded conch pearl. The coating is seen on the right side (brown), covering the surface of the conch. © D. Mathys, ZMB laboratory, University Basel, Switzerland.

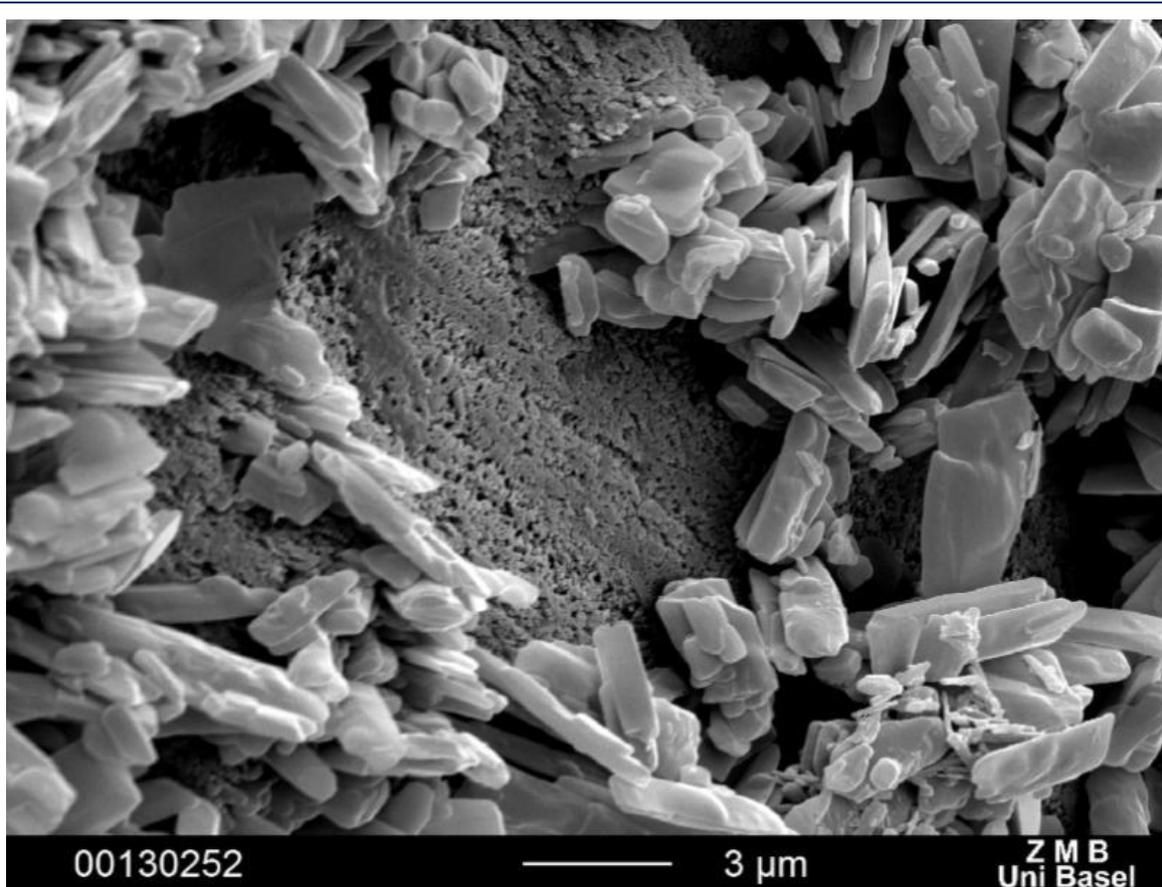


Fig. 4: Scanning electron micrograph (5000x magnification) showing the corroded conch surface covered by acicular solid precipitates forming a dense whitish encrusting on the surface. © D. Mathys, ZMB laboratory, University Basel, Switzerland.

The Swiss Gemmological Institute, part of the Swiss Foundation for the Research of Gemstones (SSEF: Schweizerische Stiftung für Edelstein-Forschung) was founded by trade organisations in 1974 and works independently on a scientific basis. This Foundation comes under the aegis of the Federal Department of Internal Affairs. The function of the SSEF laboratory is to analyse precious stones and issue test reports for diamonds, coloured stones and pearls.

The SSEF is supervised by a board of seven members, the laboratory being directed by Dr. M.S. Krzemnicki. All laboratory gemmologists have a scientific and gemmological education and work on a high level of experience and integrity. The laboratory is equipped with the most modern analytical instruments. This ensures the detection of the authenticity of gemstones and gem treatments on a scientific and reproducible basis.

Recently, SSEF has become an active and contributing partner in the the world's oldest gemmological publication, the *Journal of Gemmology* that is published by Gem-A, the UK.

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