7 September 2017

Ms. Lisa A. Rosenthal, Esq.
[redacted]
New York, NY [redacted]

RE: MT17-0220 – Analysis of material taped to a letter

Dear Ms. Rosenthal,

We have completed our analysis of the alleged glass-contaminated pastry sample, associated with case references: Al-Fatah Stewart Vs. Richardson, et. al., S.D.N.Y., Case No. 15-CV-9034 (VLB) and Al-Fatah Stewart v. New York DOCCS, et. al., NY Supreme Court Index Number 101912-16. This report describes our analytical methods, documents the results we obtained, and discusses the conclusions we have drawn from them.

Sample

The following sample was received at our laboratory on 17 August 2017:

- One envelope from the Sullivan Correctional Facility addressed to Lisa A. Rosenthal, Esq. containing two pages of paper to which a sample of an allegedly contaminated pastry had been taped.

Tasks

- Examine the object and screen for the presence of glass.
- Test the recovered glass fragment(s) for the presence of saliva.
- Attempt to determine if the suspect glass fragment(s) was baked with the alleged pastry.

Analytical Approach

Initial Examination

The sample was photographed to detail its condition upon receipt (Figures 1 and 2). It consists of a portion of an alleged pastry taped to the bottom of a hand-written letter within a paper envelope. The sample (tape included) was removed from the paper and transferred to a plastic Petri dish. Examination of the sample using a low power stereomicroscope reveals numerous colorless, lustrous, irregularly shaped fragments (Figure 3). These fragments contain sharp edges and are visually consistent with glass. Additional debris, including hairs, fibers, and paper fragments are present with the sample, but were not examined or analyzed.

Several of the suspect glass particles were isolated from the sample (Figure 4). This represents only a small subset of the glass fragments observed in the alleged pastry, which, in total, likely exceeds one hundred such particles. An X-ray photograph of the sample was captured in attempt to illustrate the number of glass fragments present. The resolution of the X-ray image prevents resolution of all but the largest such particles (Figure 5), which appear as bright spots in the image.

Glass Characterization

A subset of these particles was specifically identified as glass based upon their insolubility in water and the fact that they are isotropic when observed between crossed polars on a polarizing light microscope (PLM). Several of the glass fragments were mounted on a carbon adhesive substrate (after having been extracted for saliva testing, discussed below) for elemental analysis by means of scanning electron microscopy/energy dispersive X-ray spectrometry (SEM/EDS). Each fragment that was analyzed shared a general composition that is consistent with soda-lime glass. A typical EDS spectrum from one of the glass fragments is provided in Figure 6.

Saliva Testing

The glass fragments isolated from the pastry sample were extracted in a buffer solution which was screened for the presence of saliva using a human specific, immunochromatographic test. Saliva was not detected on the glass fragments (Figure 7). A portion of the alleged pastry material was also swabbed and tested for the presence of saliva; none was detected (Figure 8). Positive and negative control samples were analyzed contemporaneously which demonstrated that the test was properly functioning.

Residue Examination

A representative portion of the matrix from which the glass fragments were recovered was mounted on a microscope slide for identification. This material has been identified as a mixture of gelatinized and nongelatinized starch grains, gluten, and oil (Figure 9). A unicellular plant trichome was also observed in the preparation. The morphology and size of the ungelatinzied starch grains are visually consistent with wheat starch. Together, these components are consistent with a wheat-based dough product. While these ingredients are found in pastries, this composition is consistent with many possible baked-goods.

The dough material is somewhat hard and granular with the appearance of having been pressed together. No gross morphology or other characteristics that could be directly associated with a pastry, or other specific class of baked-good, can be elucidated from the submitted sample. This prevents a determination of how the glass fragments were distributed in the alleged baked-good (*i.e.*, given the current condition of the sample, it is not possible to determine if the glass fragments were on top of the dough-based object or distributed throughout it).

The glass fragments recovered from this material have residue of the dough-based object on their surfaces, though it is not well-adhered. The observation suggests, but does not definitively prove, that the glass was added after the dough was baked.

Summary and Conclusions

A sample of an alleged tainted pastry was received taped to a hand-written letter. The material taped to the letter has been identified as a dough-based material containing numerous (likely more than one hundred) small fragments of colorless, soda-lime glass. The glass fragments and dough-based portion of the sample were each screened for the presence of human saliva, which was not detected on either component of the sample.

The alleged pastry material, as received at our laboratory, shows no shape or morphology that can be related directly to a specific category of baked good. While the glass fragments are intermixed with the submitted dough-based sample, the lack of gross morphology prevents us from placing constraints on how or where (in or on) the glass fragments became associated with the baked-good. It was also noted that none of the glass fragments recovered from the sample contain well-adhering residue on their surfaces. This latter observation provides some evidence that suggests the fragments may have been added at some point after baking; however, the alternative possibility cannot be ruled entirely due to sample limitations.

Additional analysis of the glass fragments may provide further constraints on the possible source(s) from which these fragments could have originated.[1] Furthermore, if a suspected source(s) of these fragments is identified, a detailed comparative analysis could be completed. If these additional avenues of analysis are important to the investigation, please contact us at your convenience to discuss them.

If you have any questions concerning this report, or if we may be of further assistance, please do not hesitate to contact either of us directly. It is our policy to retain samples for 30 days after completion of our report, at which time they will be discarded. If you would prefer to have the samples archived or returned, please contact us to make these arrangements before then. Thank you for consulting Microtrace.

Sincerely,

Ethan Groves
Research Microscopist

Christopher S. Palenik, Ph.D.
Senior Research Microscopist

[1] It is possible to characterize the glass fragments in greater detail, including examination of surface characteristics (*i.e.*, contour), trace element composition, and thickness, which may provide constraints on the specific type of object(s) from which these broken fragments originated.

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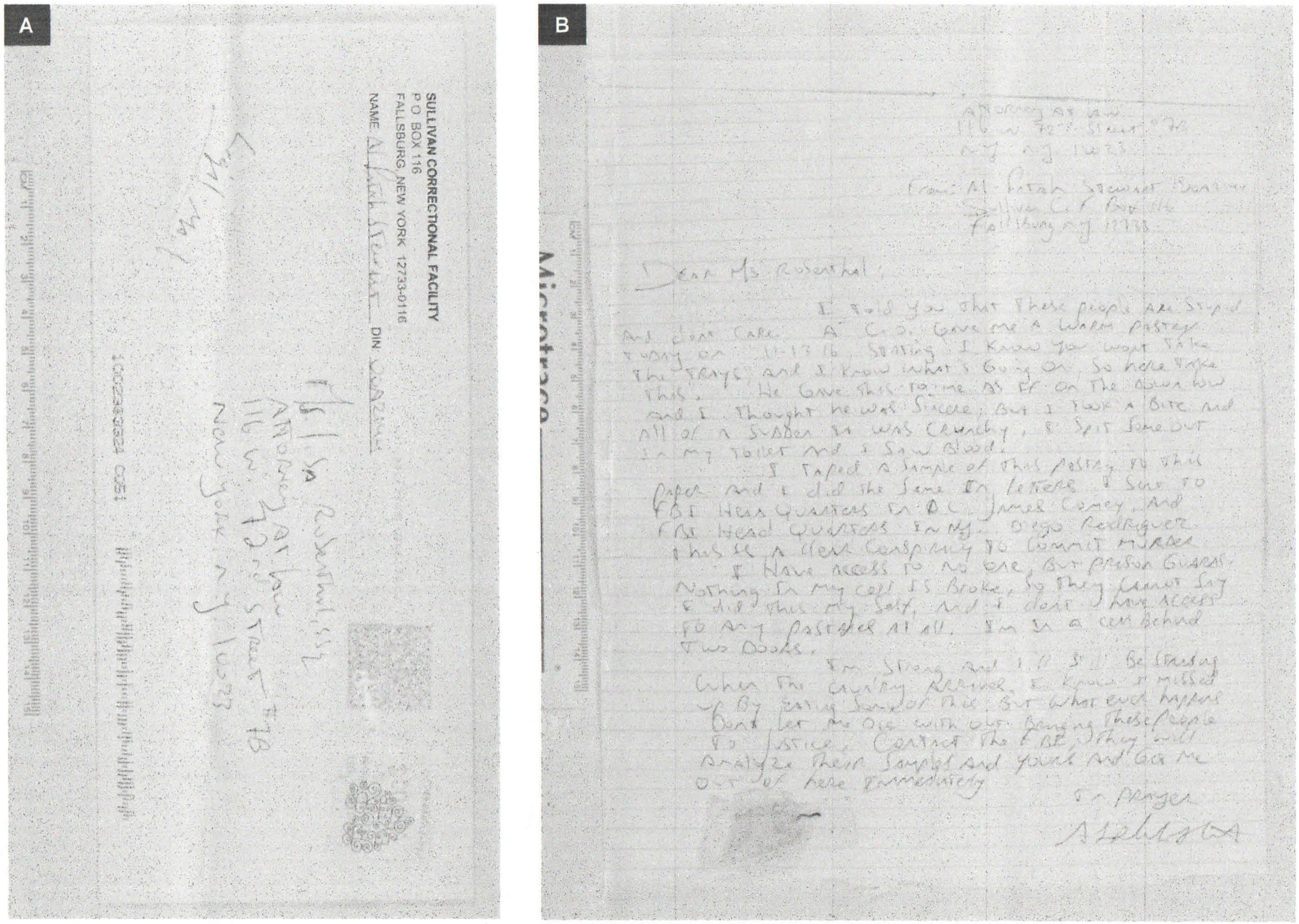

Figure 1. (A) Envelope containing sample. (B) Sample, as received, taped to a hand-written letter.

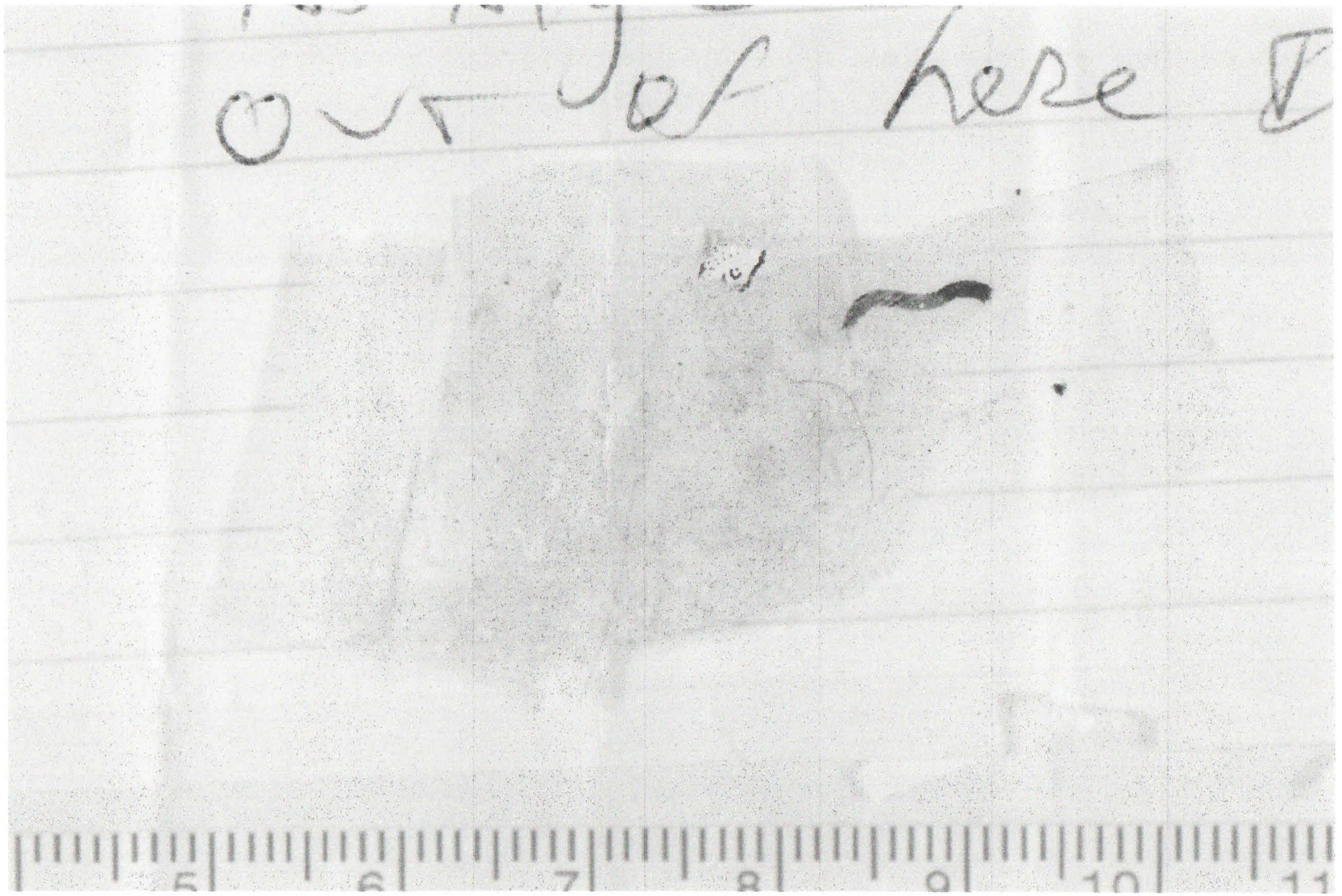

Figure 2. Detailed view of the sample, as received, taped to the hand-written letter.

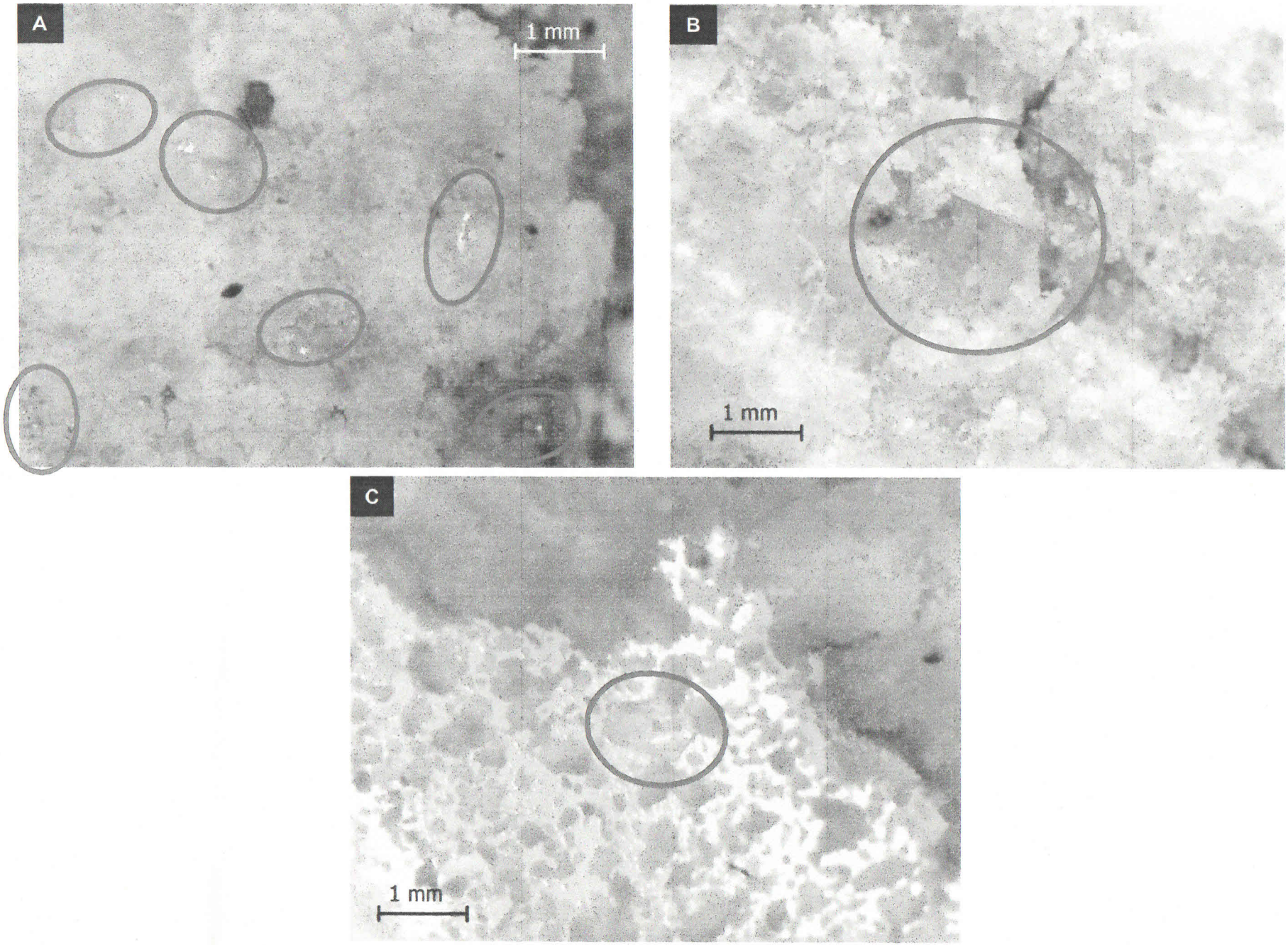

Figure 3. Detailed view of the complaint sample, viewed with a stereomicroscope. Several small, glass fragments are observed in the sample (red circles).

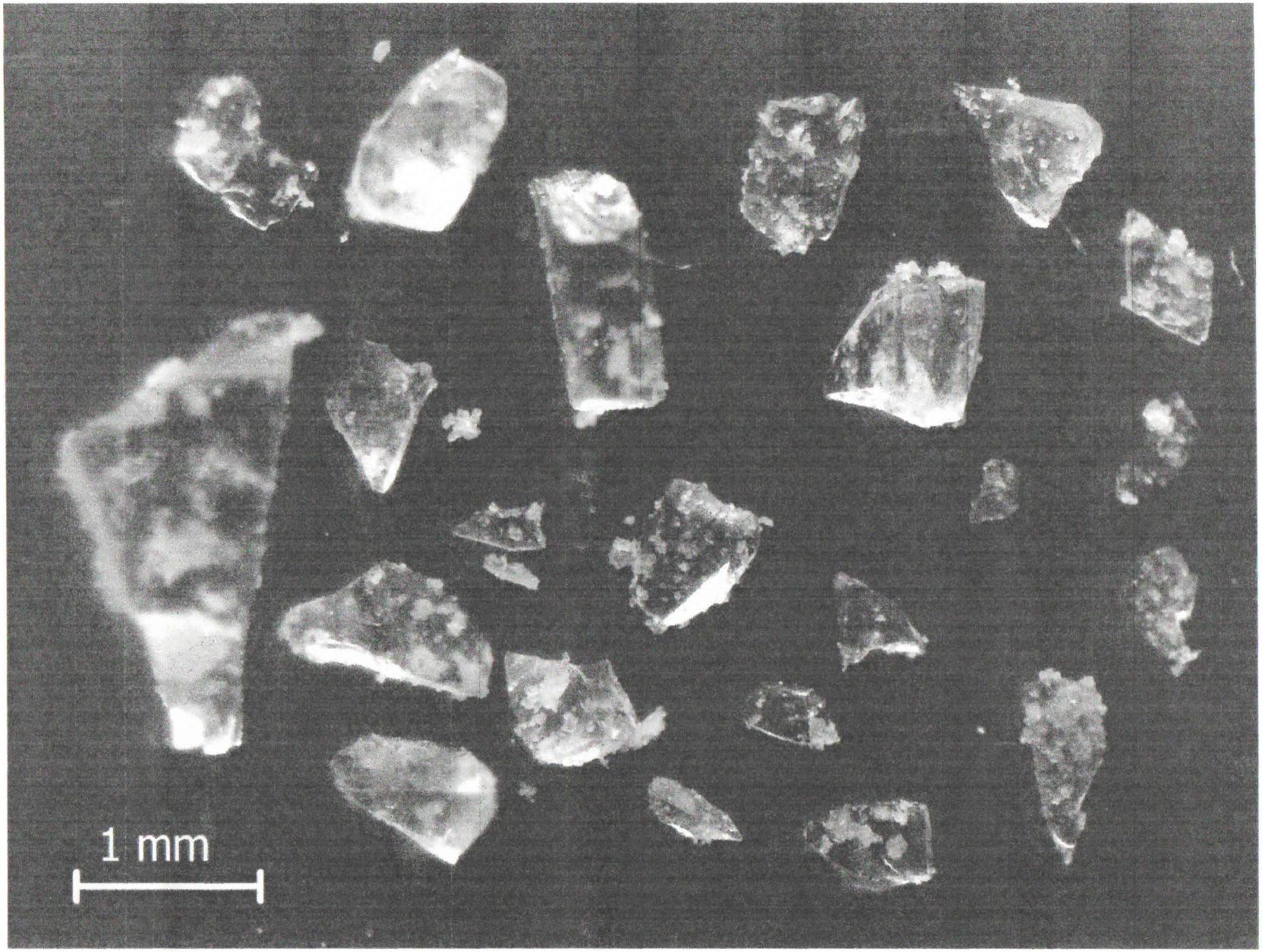

Figure 4. Suspect glass fragments isolated from the complaint sample. Note this does not represent all of the fragments present in the sample.

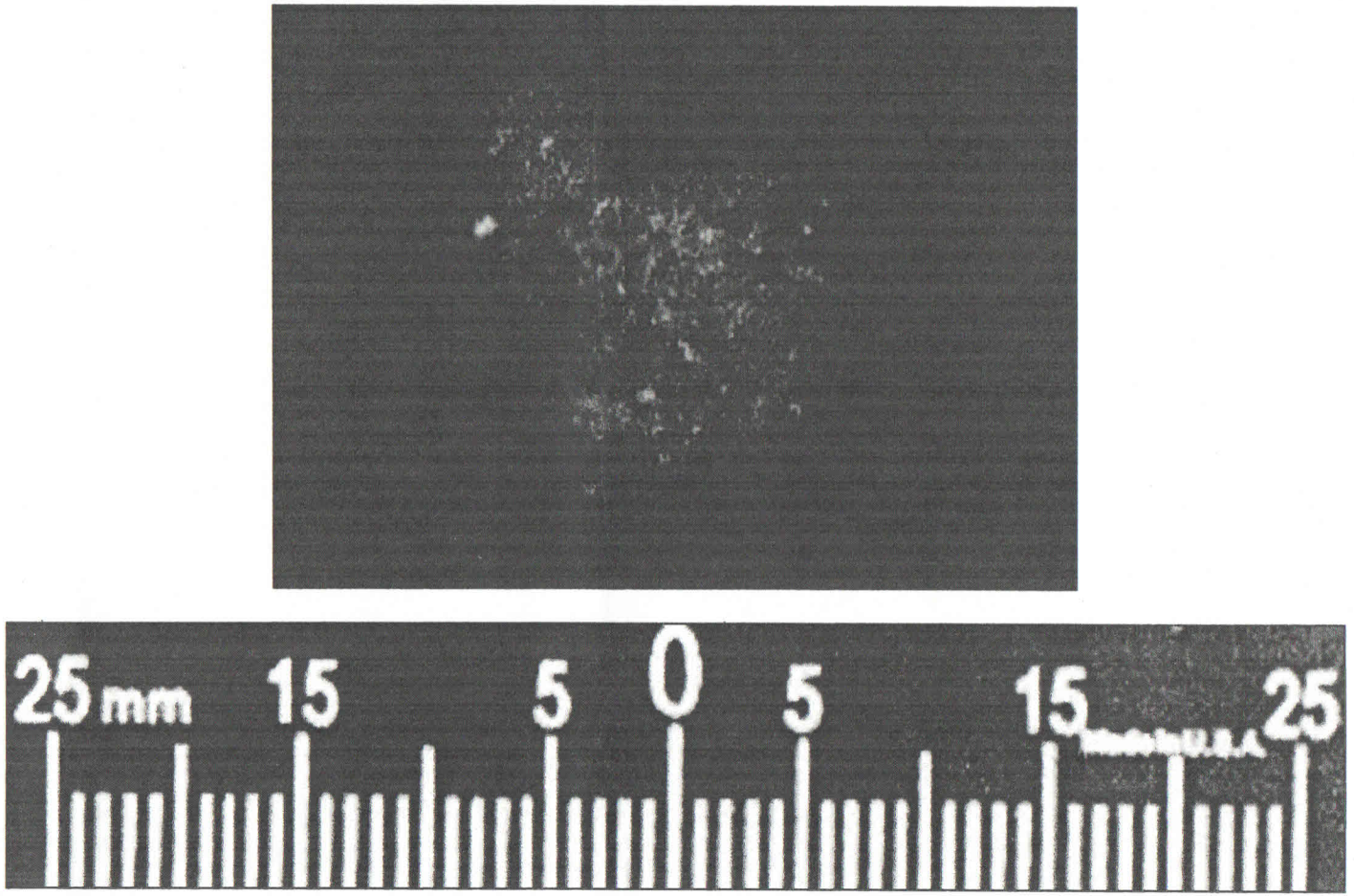

Figure 5. X-ray photograph of the complaint sample in a petri dish. The bright spots in the object correspond to glass fragments. Due to the small size and thin nature of many of the fragments, some of the glass particles in the sample may not be observed in the X-ray photograph.

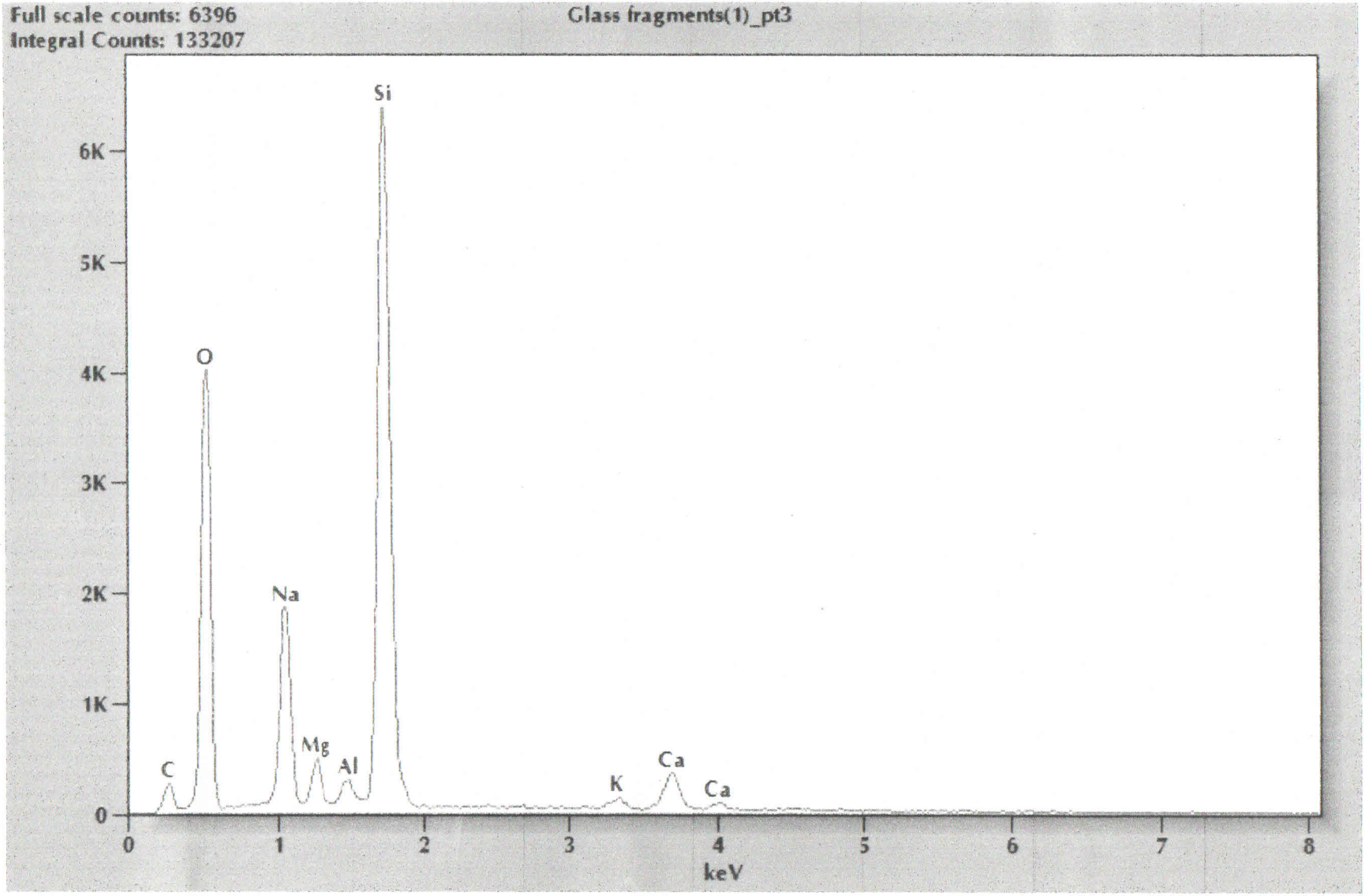

Figure 6. Typical EDS spectrum of a suspect glass particle isolated from the pastry.

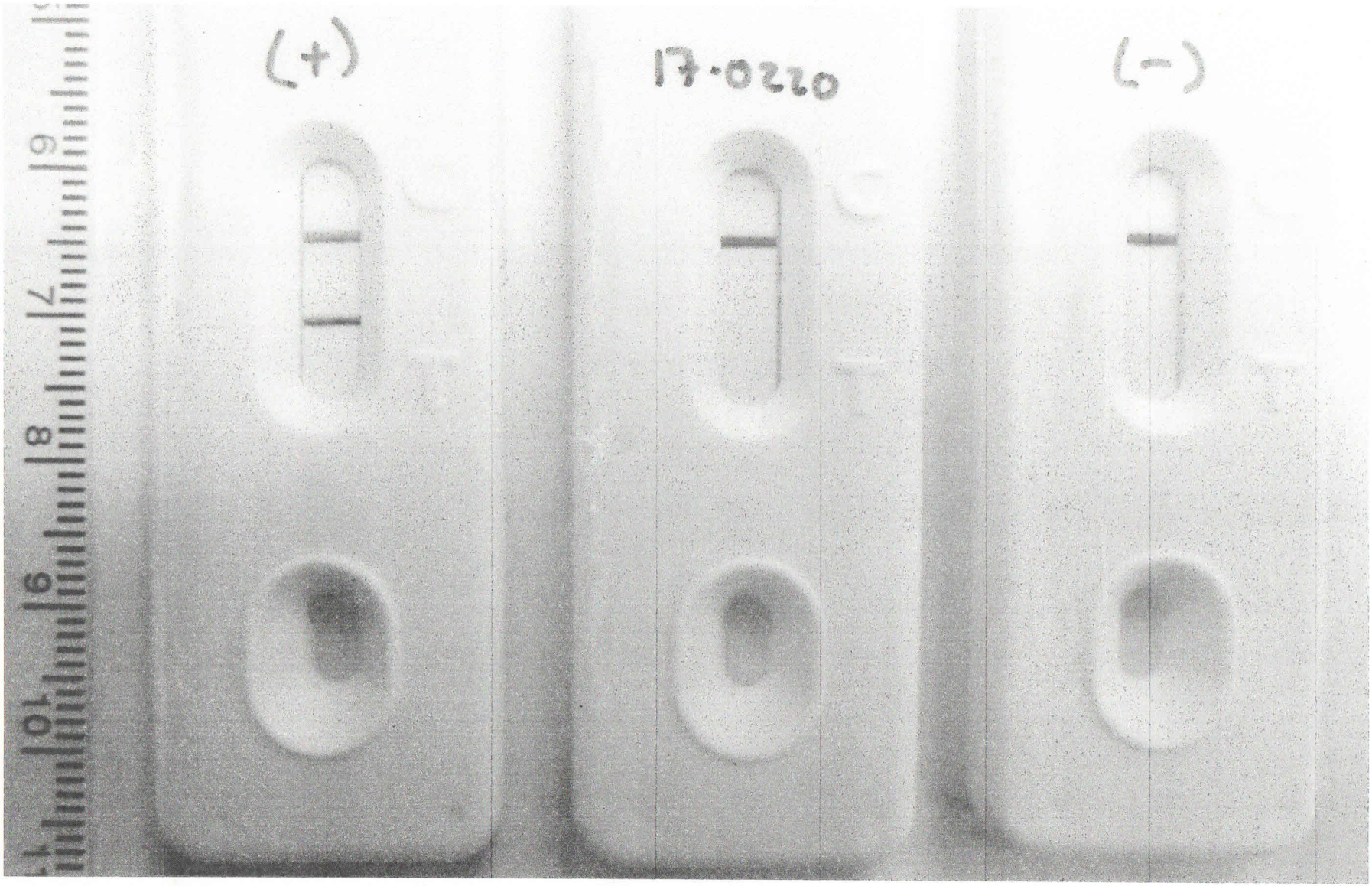

Figure 7. Saliva test result. Left to right → positive control, questioned sample (glass fragments), negative control. In each test the top red line (at the "C" position) indicates the proper functioning of the test. The lower red line (at the "T" position) provides the test result.

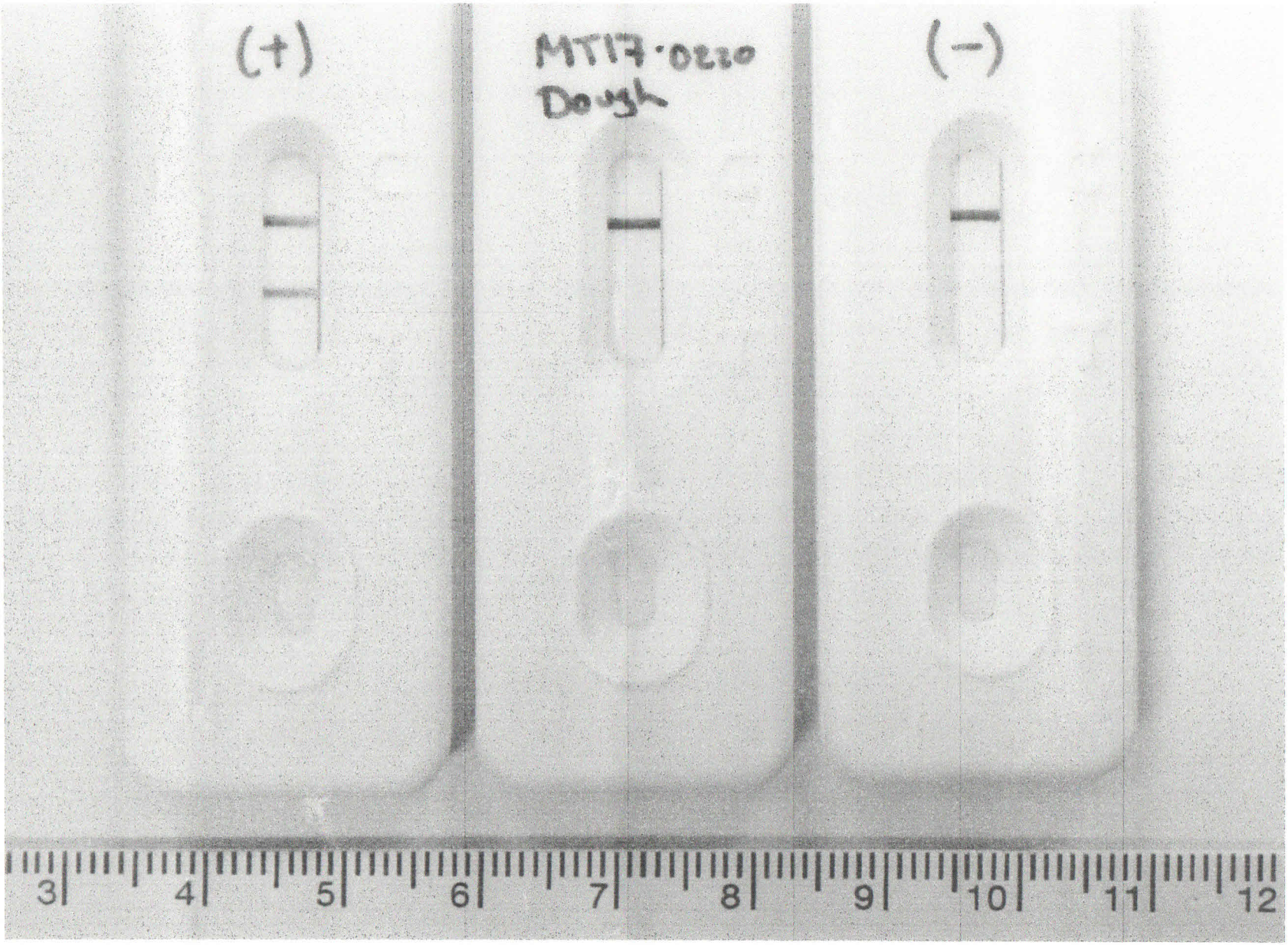

Figure 8. Saliva test result. Left to right → positive control, questioned sample (dough component), negative control.

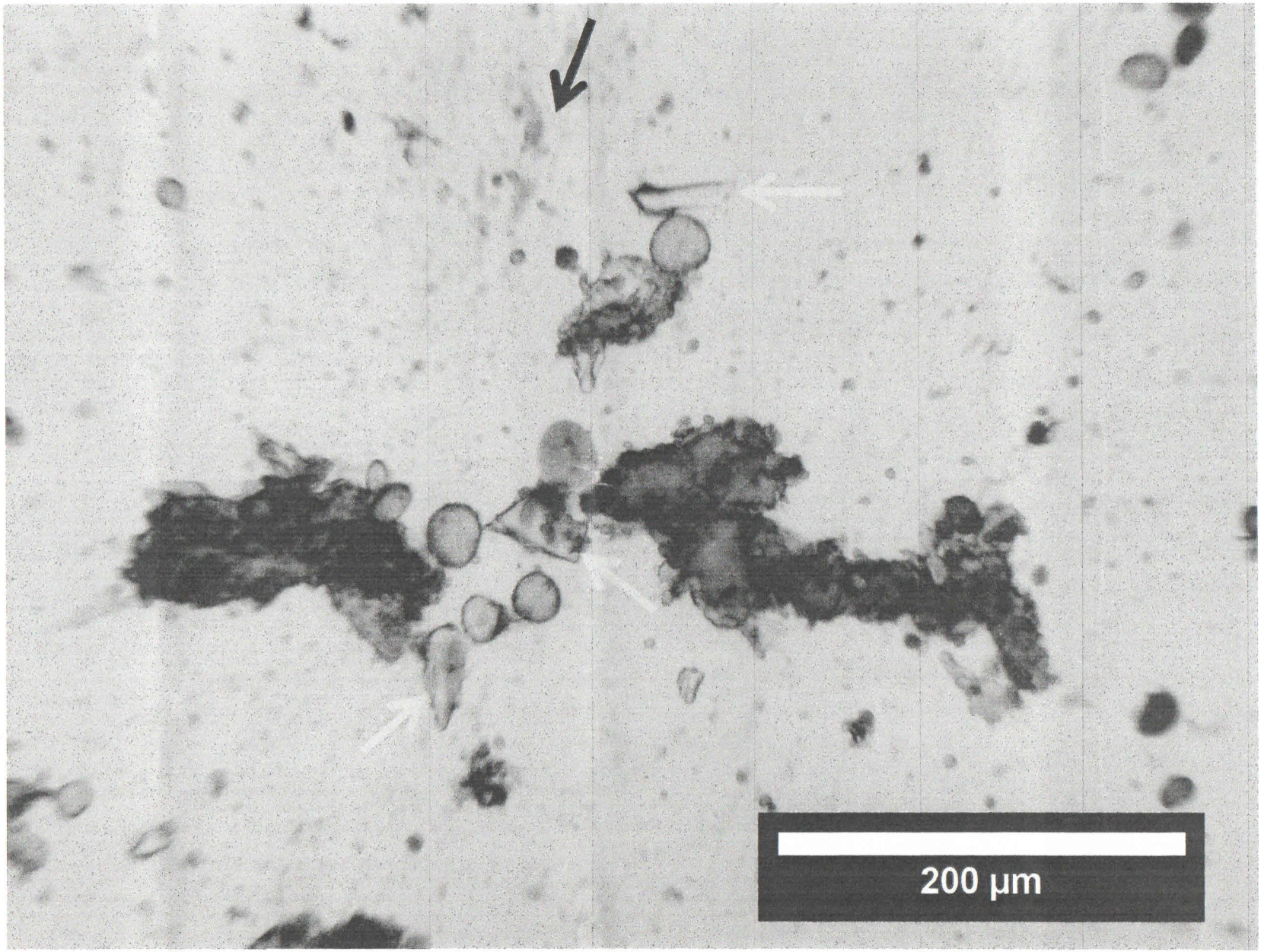

Figure 9. A sample of the alleged pastry from which the glass fragments were recovered. The preparation has been stained to identify the components. Green – gluten, purple – starch, gray – oil (black arrow). Small glass fragments are also observed in the preparation (yellow arrows).