

Documenting and preserving textile heritage using digital documentation techniques: The conservation and restoration of headgear from the Baltazar Bogišić collection in Cavtat

Danijela Jemo*, Danijela Erak

University of Dubrovnik, Dubrovnik, Croatia

*Corresponding author: djemo@unidu.hr

Received January 26, 2024

UDC 687.4.004.67

Original scientific paper**

This paper focuses on methods of the Digitization of tangible cultural heritage, specifically on digital techniques used in recording the conservation and restoration process performed on a 19th century headgear from the Baltazar Bogišić collection in Cavtat. Tangible cultural heritage is in constant process of deterioration, so it is crucial to combine old and new technologies and digitization methods to improve our ability to preserve it. The methodological approach to conservation and restoration documentation of headgear includes written text, as well as different photographic and graphical records. The data comprises information related to the condition of object, material composition, manufacturing techniques, as well as data obtained during conservation and restoration treatment. Detailed and professionally made conservation and restoration documentation should provide all the key information relevant for the future researcher, curator, or conservator.

Keywords: *tangible cultural heritage; Digitization; textile conservation and restoration; headgear*

Izvorni znanstveni rad**

Ovaj se rad bavi metodama digitalizacije materijalne kulturne baštine, konkretnije digitalnim tehnikama korištenima u bilježenju konzervatorsko-restauratorskih postupaka provedenih na pokrivalu za glavu, odnosno ženskoj kapi iz 19. stoljeća, a koja je dio fundusa Zbirke Baltazara Bogišića u Cavtatu. Materijalna kulturna baština je u stalnom procesu propadanja, stoga je ključno kombinirati stare i nove tehnologije te metode digitalizacije, s ciljem poboljšanja njezinog očuvanja. Konzervatorsko-restauratorska dokumentacija predmeta o kojem je u ovom radu riječ uključuje pisani tekst, te razne fotografske i grafičke zapise. Podaci obuhvaćaju informacije koje se odnose na zatečeno stanje predmeta, sastav materijala od kojih je predmet izrađen, tehnike izrade i podatke dobivene tijekom provođenja konzervatorsko-restauratorskih postupaka. Detaljna i stručno izvedena konzervatorsko-restauratorska dokumentacija treba pružiti sve ključne informacije bitne za istraživače, kustose ili konzervatore.

Ključne riječi: materijalna kulturna baština; digitalizacija; konzervacija-restauracija tekstila; pokrivalo za glavu

*Paper presented at the 16th Scientific-Professional Symposium Textile Science And Economy, Jan 26, 2024, Zagreb, Croatia

1. Introduction

The primary goal of textile conservation and restoration is to ensure the preservation of fragile and valuable textile heritage for the future. Traditional conservation and restoration approach involves a material intervention to the object in question. Each cultural heritage object has its own unique characteristics and it is up to the expert to determine which type of analysis and documentation techniques are best to apply [1]. Conservation and restoration activities include examination, treatment, documentation, and preventive care, supported by research and education (Fig.1).

Unlike written contemporary documentation, in modern documentation, a methodological approach largely depends on how crucial information is gathered and presented. The use of digital technology in the field of textile conservation and restoration develops and improves documentation possibilities of textile cultural heritage which, as organic matter, is in a constant process of decay. Before performing any conservation and restoration treatment or introducing new materials, it is important to thoroughly investigate the object using a diverse range of techniques.

The application of digital technology has a great advantage and benefit in this process. Conservation and restoration documentation can be defined as textual and visual records collected during the care and treatment of an object (Fig.2).

New digital technologies can be used for many purposes in the context of documenting the conservation of cultural heritage, namely historical interpretation, planning intervention, monitoring, and supervision of the object's condition, comparison of different restoration phases, simulation of the object degradation, computer-assisted restoration, the application of virtual and augmented reality techniques, digital catalogs, etc. [2]. Nowadays, specialized software is being developed for museum conservators and restorers. This enables the creation of conservation reports with tailored templates, such as condition and treatment reports, treatment proposals, surveys, and others pertaining to the conservation and restoration area [3].

Conservators occasionally use fabric supports with digital and hand printing techniques to enhance the structural stability of objects and create a visual infill in missing areas.

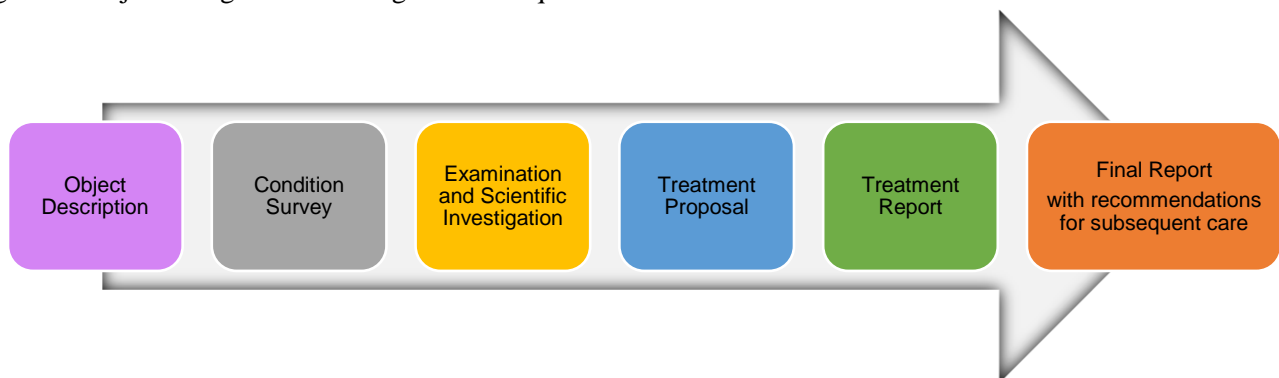


Fig.1 A graphic representation of a methodical approach to the conservation and restoration process

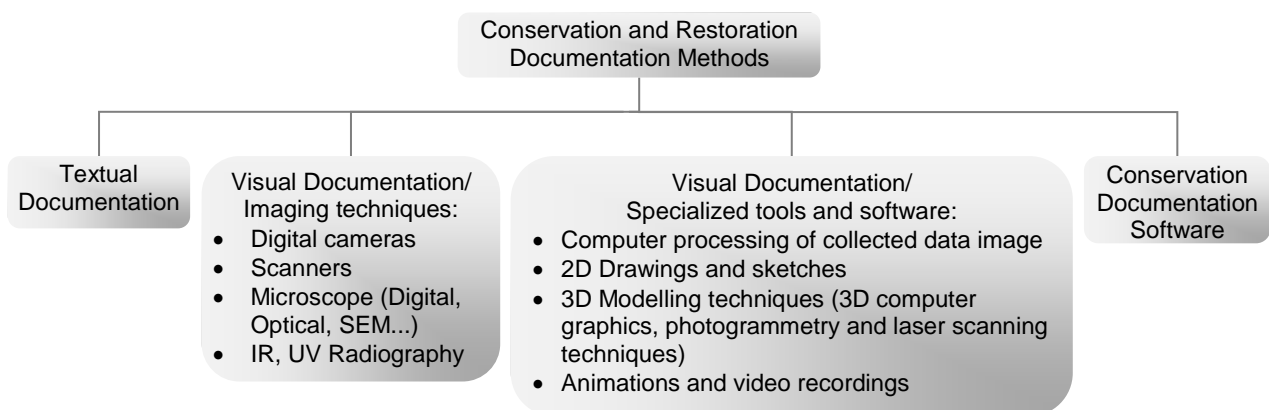


Fig.2 Different examination and documentation techniques used by conservators and restorers when observing the object in their care and recording the treatments performed

It is commonly used with patterned or textured fabrics to modify the appearance of supporting fabrics and improve the visual presentation of objects [4]. A multi-layered textile object composed of various fibers and materials has complex physical and chemical structures that present unique preservation challenges. One such object is the headgear from the Baltazar Bogišić Collection described in this paper. The object was examined, its condition recorded, and all treatments documented using non-invasive methods. All collected data was digitalized and combined in the final report, equipped with drawings, photographs, mapping, etc.

2. The Headgear from the Baltazar Bogišić Collection

The headgear from the holdings of the Baltazar Bogišić Collection in Cavtat is a 3D object in irregular oval shape, with approximate dimensions of 20 x 28 x 9 cm (Fig.3a). The crown part of the hat is made from light white cotton fabric, arranged around a solid band via inverted pleats (Fig.3b). The rim is decorated with black velvet ribbon and a row of white bobbin lace. The crown part of the hat is additionally decorated with a black velvet ribbon bow surrounded with rows of bobbin lace (Fig.3c).

Photography is a basic tool for documentation of cultural heritage. Photographs with visible light taken with a high resolution digital camera are used to register, document and digitalize the images of the total and the details of the object in question (Fig. 3). The study of cultural objects with regard to shape, techniques and materials used in their production, help determine provenance and provide more context for an object's place in history. According to fashion magazines from the 19th century, smaller hats with relatively shallow crowns and without a solid brim, those richly decorated with lace, bows, ribbons, and flowers, with or without embroidery, are characteristic mainly of the second half of the 19th century,

mostly of the 1870s [5,6]. The fact headgear this article considers is a part of the holdings of the Baltazar Bogišić Collection in Cavtat may indicate its origin, given that Bogišić lived in Paris for 30 years of his life, but he also stayed in Odesa, Vienna, etc., so one must be careful when drawing definite conclusions [7-9].

Detailed written, graphic, and pictorial documentation, was carried out before, during, and after the conservation-restoration treatment of an object.

2.1. Technical study of three-dimensional headgear

The first steps carried out provided information on the material aspects of an object. Those include pattern analysis, the manner of assembly, and technical analysis of the fabric properties such as weave structure, yarn twist, and microscopic analysis of textile fibers. The object is constructed of several cutting parts and types of fabric. For the sake of clarity, all elements have been divided into four segments. Those are crown, brim, velvet ribbon, and velvet ribbon and bobbin lace decorative detail. The manner of assembly of all four segments is graphically documented in great detail (Fig.4).

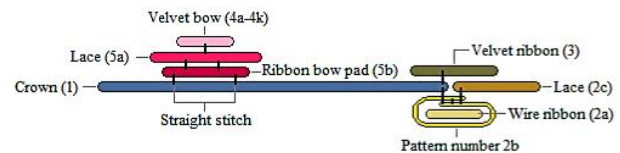


Fig.4 Graphic representation of exact position of each element

The main aesthetic feature of the object is a black bow made of velvet ribbon. This intriguing piece is documented using various forms of digital documentation, including digital cameras, microscopes, and special software such as Photoshop, Paint, and StreamStart (Fig.5).

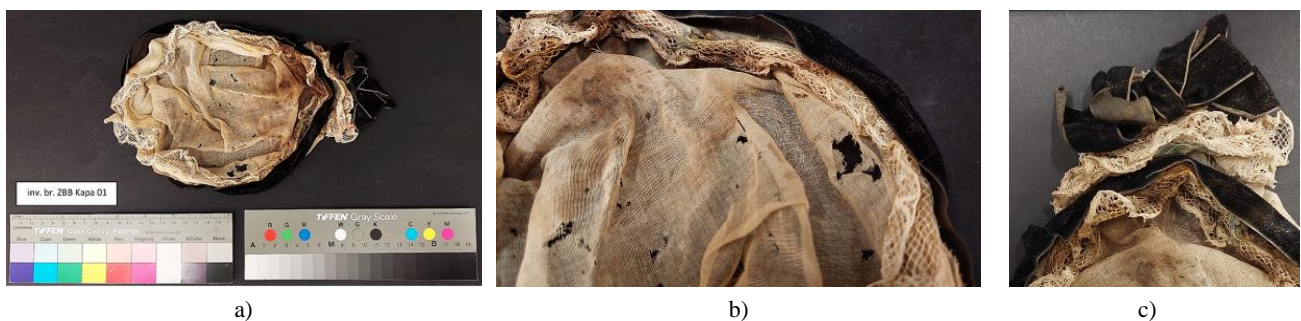


Fig.3 Photo-documentation of object before treatment: a. photography of total, b. and c. photography of detail

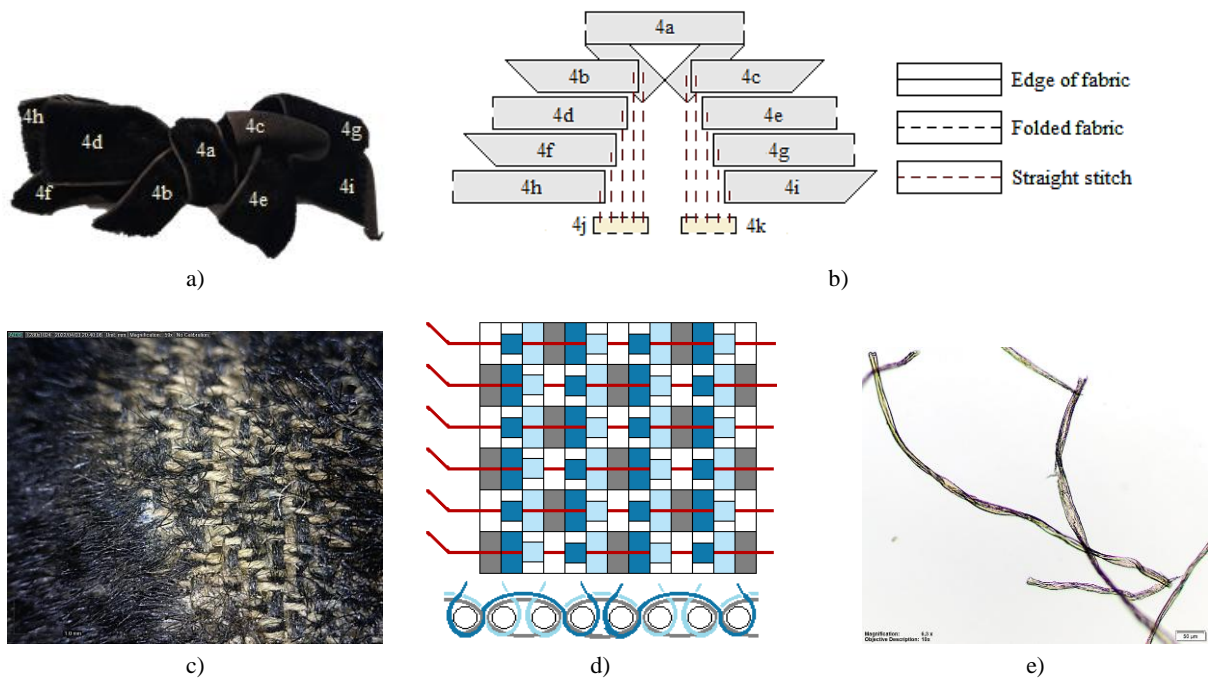


Fig.5 Documenting a bow made of velvet ribbon, a. Pattern cuts labeled with numbers and letters, b. schematic representation of layout of pattern cuts and sewing stitches, c. Velvet fabric recorded with Dino-Lite Pro Digital AM413T Microscope (magnification 59x), *DinoCapture 2.0* software, d. Ground construction weave: *Gros de Tours*; Pile weave: imitation of warp (warp density: 28 ends/cm; weft density: 56 picks/cm), e. Micrograph taken through Olympus BX40F4 light microscope, SC30 camera and StreamStart software

2.2. Condition survey

The object is in a very poor state of preservation. Due to the accumulated impurities, the fabric has darkened considerably, and a number of creases and wrinkles can be observed all over the object's surface. Another types of damages observed are holes, tears in seams, and gray and brown colored stains. Stains and holes are most pronounced on the upper part of the crown. All types of damages are documented descriptively, photographically, and graphically (Fig.6).

The loss of material (from 1 to 3 cm in length) on the wire ribbon (pattern number 2a) and on the cotton fabric around the wire ribbon (pattern number 2b) is particularly noteworthy. The loss of material occurred due to the corrosion of the metal wire that acts as a warp in the cotton ribbon placed inside the brim of the hat.

2.3. Documentation of conservation and restoration treatment

Conservation and restoration treatment started by separating four segments of the headgear: crown, velvet ribbon, brim, and decorative detail, apart (Fig.7). This provided access to damages.

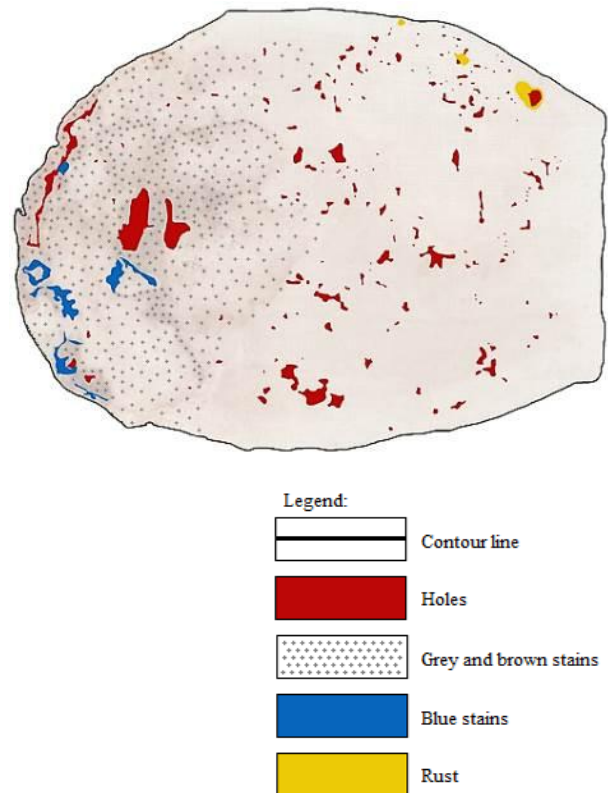
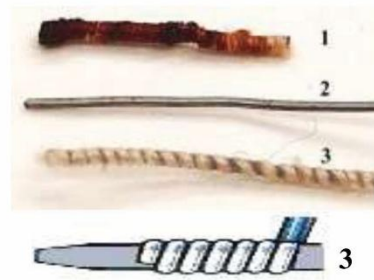


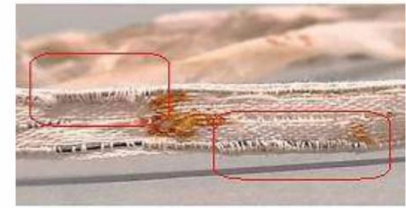
Fig.6 Graphic representation of damage on the crown part of the headgear



Fig.7 The brim of the hat after the removal of the seam used to attach the bobbin lace (pattern cutting number 2c) to the cotton ribbon (pattern cutting number 2b)



1 – original wire
 2 – new wire without wrapping
 3 – new wire wrapped in cotton thread



The places where the original and new wires overlap.

Fig.8 Making a replica of the metal wire used to substitute rusted parts. The central part consists of cotton ribbon with metal wire wrapped in cotton thread

The mechanical surface cleaning of the textile was carried out next. This was executed by vacuuming on low suction, through a nylon screen placed over the textile. Wet cleaning was used to remove the soil from the crown fabric (pattern number 1) and from bobbin lace (both on the brim and decorative detail). Crown fabric was washed on the suction table, while the bobbin lace was treated locally. In both cases, a non-ionic detergent with a neutral pH was used. Rust stains found on pattern number 1 and on bobbin lace were removed with ferrosolve. The areas where textile was in a very poor state were not treated to prevent its disintegration and decay.

During the conservation and restoration process, an interesting and inventive task was to preserve and create a replica of the original wire found in the object's structure. (Fig.8).

Since holes, rips, and loss of warp, or both warp and weft yarns, located on different materials and parts of the headgear are of various intensities; they required a combination of two different stabilization techniques (Fig.9).

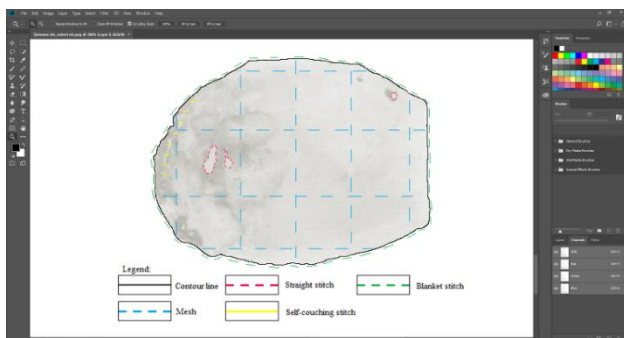


Fig.9 Graphic representation of the consolidation of mechanical damages located on the crown (pattern cutting number 1) utilizing hand-sewn underlay (silk) and overlay (tulle) support fabrics, created using Photoshop photo editing and graphic design software.

Damaged areas were thus secured to a support fabric placed underneath alone (underlay) or both underneath and above-treated areas (underlay and overlay). The stitches used were self-couching (for underlay) and straight stitches (for overlay). For illustration purposes, Fig.10 shows the object before and after conservation-restoration intervention.



Fig.10 Comparison of the object before and after a conservation-restoration treatment - photographed from above

2.4. Design and fabrication of mounts for the safe display, transport, and storage

Materials used in the construction of a mounting system include polyester batting (60 g/m²), polyester wool (avos), Tyvek, and white synthetic thread.

Selected materials are non-toxic and do not interfere with the aesthetic appearance of the artefact. Polyester batting pieces were manipulated into irregular oval forms and joined by hand using a straight stitch. The lower part of a mount is bigger in size, and as such provides support for rows of bobbin lace, while the upper part is smaller in size in order to fit into the interior part of the hat (Fig.11).



Fig.11 Mounting system designed for storage and display, with the headgear securely in place

Its shape is determined by the contour of the head. The archival storage box was made of unbuffered cardboard in dimensions that correspond to the base of the mounting system (Fig.12). Careful handling is essential to preserve this delicate object and, it must be kept to a minimum. Ideally, it should only be moved when placed inside the mounting system provided.



Fig.12 Headgear fitted onto a mounting system and placed inside a custom-made archival storage box

3. Conclusion

The application of different documentation methods and digital technologies in the conservation-restoration process of headgear from the Baltazar Bogišić collection in Cavtat has enabled detailed and efficient documentation. Defining, mapping, and assessing deterioration were done by digital documentation techniques. Using a digital camera and a digital microscope in combination with Adobe's Photoshop program and DinoCapture 2.0 software, a general view of the most common types of decay, such as holes, tears in seams, different types of stains, etc., was obtained. Digital photography and graphic documentation proved especially useful in providing a very detailed description of the materials, manufacturing techniques, information about the object's current physical state, as well as describing the conservation and restoration process. All the actions taken towards the long-term preservation of three-dimensional headgear were documented in the final report created as a digital document that enables easy storage, accessibility, sharing, and usage. Documenting and transmitting cultural heritage to future generations is an important task and responsibility for experts involved in the field of textile conservation and restoration.

References:

- [1] Prown, J. D. Mind in Matter: An Introduction to Material Culture Theory and Method. *Winterthur Portfolio*, **1982**, 17(1), pp. 1-19.
- [2] Brooks, M.M.; Eastop, D. *Changing Views of Textile Conservation*. Getty Conservation Institute: Los Angeles, CA, USA, **2011**; ISBN 978-1-60606-048-6.
- [3] Beck, L. Digital Documentation in the Conservation of Cultural Heritage: Finding the Practical in Best Practice. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.* **2013**, XL-5/W2, pp. 85–90.
<https://doi.org/10.5194/isprsarchives-XL-5-W2-85-2013>
- [4] Gallery Systems. Conservation Documentation. Available at:
<https://www.gallerysystems.com/solutions/conservation-documentation/> Accessed: 20/11/2023
- [5] Lennard, F.; Baldursdóttir, T.; Loosemore, V. Using Digital and Hand Printing Techniques to Compensate for Loss: Re-Establishing Colour and Texture in Historic Textiles. *The Conservator* **2008**, 31(1), pp. 55–65.
<https://doi.org/10.1179/014000108X124644>

- [6] HathiTrust. Available at:
<https://babel.hathitrust.org/cgi/pt?id=mdp.39015034639677&view=2up&seq=6>
Accessed: 10/11/2023
- [7] HathiTrust. Available at:
<https://babel.hathitrust.org/cgi/pt?id=umn.31951d00322057j&view=2up&seq=198&size=125>
Accessed: 10/11/2023
- [8] Grbeša, C.; Šoša, T.; *et al.* Postavljanje spomen-ploče Baltazaru Bogišiću u povodu 175. obljetnice rođenja. Pariz, 18. prosinca 2009. *Anali Zavoda za povijesne znanosti HAZU u Dubrovniku* **2011**, 49, pp. 335–340. <https://hrcak.srce.hr/70902>
- [9] Bogišić, V. Bogišićevi autobiografski koncepti. In: *Spomenica dra Valtazara Bogišića o tridesetogodišnjici njegove smrti*. Odbor za komemoraciju 30-god. smrti dra Valtazara Bogišića: Dubrovnik, Croatia, **1938**, pp. 33–55.
- [10] Bogišić, V. Autobiografija. In: *Spomenica dra Valtazara Bogišića o tridesetogodišnjici njegove smrti*. Odbor za komemoraciju 30-god. smrti dra Valtazara Bogišića: Dubrovnik, Croatia, **1938**, pp. 57–134.