

Comment

Comment on Sandu et al. Authentication of a Stradivarius “Petite Violin” Type from 1723. *Appl. Sci.* 2023, 13, 1048

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We read with great interest a recent article published by Sandu et al. in *Applied Sciences*—“Authentication of a Stradivarius ‘Petite Violin’ Type from 1723” [1]. We applaud the authors’ efforts to apply modern analytical techniques to the authentication of antique string instruments. Still, we do not agree with their conclusion that the violin under investigation was made by Antonio Stradivari in Cremona, Italy. Furthermore, we would like to point out a similar issue in another article by Sandu and co-workers, “Authentication of an Old Violin by Multianalytical Methods”, which presented a “1737-type” Stradivari violin [2]. In our opinion, both instruments resemble 19th-century German-Bohemian trade violins rather than typical Stradivari instruments.

1. Preliminary Analysis Through Photographs

Although it is not possible to unequivocally identify the provenance of old violins from photographs alone, the trained eye may still identify some important traits. Figure 1a shows a well-preserved Stradivari violin from the Chimei Museum, which we previously studied [3,4]. Figure 1b shows another famous Stradivari violin from Cité de la Musique. For comparison, Figure 2a shows a 19th-century German trade violin that we previously purchased as an aged control sample for analyzing the wood shavings of Stradivari instruments [5]. Figure 2b shows a 19th-century German trade violin from the Leipzig University Museum. The darker varnish and higher arching of these German trade violins are markedly different from the golden-brown varnish and flatter arching of Stradivari violins. The two old violins analyzed by Sandu et al. (photographed in Figure 1 of ref. [1] and Figure 3 of ref. [2]) look more similar to German trade violins in Figure 2 than well-documented Stradivari violins (see Figure 1 and ref. [6–8]). Therefore, we believe that the pair of violins analyzed by Sandu et al. cannot be attributed to Antonio Stradivari or other Old Cremonese masters.

The two violins analyzed by Sandu et al. [1,2] carry labels that say “Stradivarius” and “17XX,” but they bear no resemblance to Stradivari’s original labels [6,7]. As a matter of fact, tens of thousands of cottage-industry violins were produced in the Saxon-Bohemian region in the 19th and early 20th centuries, often bearing a facsimile label of one of the great masters (Stradivari, Guarneri, Amati, or Stainer) [9]. The purpose of such generic labels was not for counterfeiting, just paying tribute to old masters. These were often called trade violins (or factory violins) from Germany or Bohemia, mainly sold to beginners and amateurs. Their lower material and workmanship qualities are easily distinguishable from the finer instruments by master makers marketed to serious musicians and collectors.

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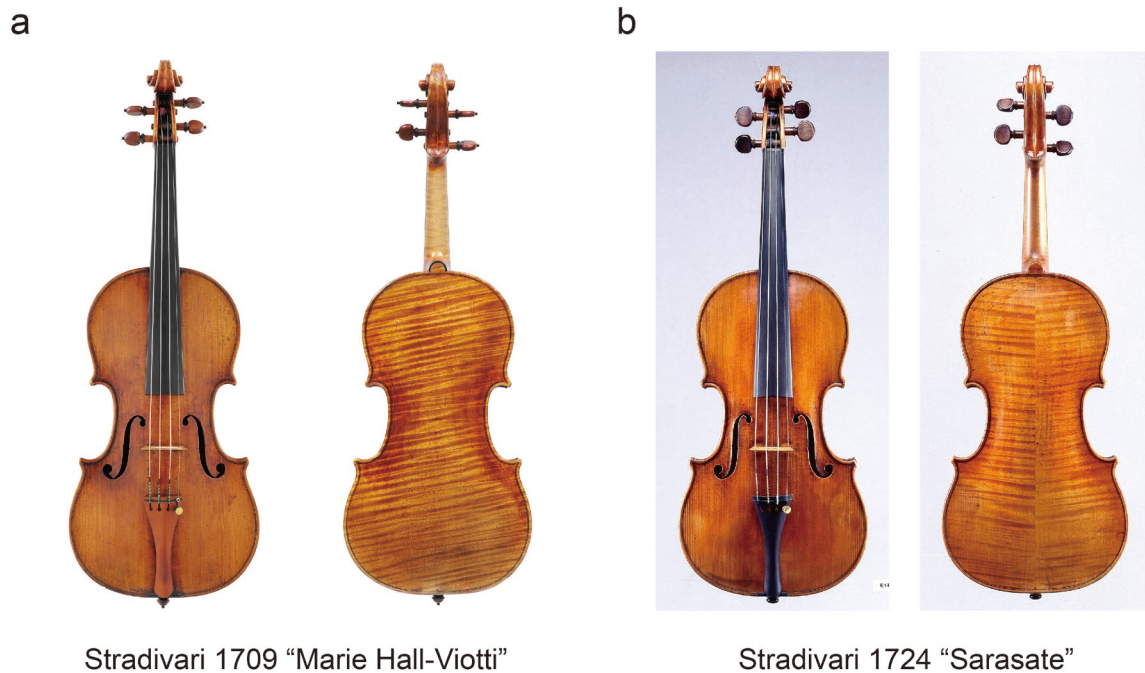


Figure 1. Two renowned violins by Antonio Stradivari. (a) The 1709 "Marie Hall-Viotti," in the collection of the Chimei Museum, Tainan. Photo courtesy: Chimei Museum. (b) The 1724 "Sarasate," in the collection of Cité de la Musique, Paris. Image source: Musical Instrument Museums Online (<https://mimo-international.com/>, accessed on 10 June 2026), public domain.



Figure 2. Two 19th-century German-Bohemian trade violins. (a) An inexpensive violin we purchased from a Czech dealer in 2019, likely of 19th-century German origin. Photographed by H. C. Tai's laboratory. (b) A German violin carrying a label saying "Se Fabrique A' Berlin Chez J.C.F. Rellstab" from the Museum of Musical Instruments at Leipzig University, likely made between 1780 and 1880. Rellstab was a German composer who owned a music business selling scores and instruments, but the label may or may not be authentic. Image source: Musical Instrument Museums Online (<https://mimo-international.com/>, accessed on 10 June 2026), public domain.

2. The Gold Standard in Cremonese Violin Identification

One of the most intriguing questions in violin research is what makes Stradivari and Guarneri del Gesù instruments stand out from the rest. For over two centuries, scholars have tried to explain the origin of their superlative tones. It would be regrettable if serious research efforts were applied to ordinary trade violins of no special interest. But how could researchers ensure or demonstrate that their research samples belong to authentic historical instruments?

The standard method for authenticating an antique Cremonese violin is careful inspection by trained experts, focusing on wood choice, varnish appearance, body proportions, scroll geometry, and craftsmanship details. If the body is opened for restoration, additional clues such as internal construction and toolmarks could provide even greater certainty. Some critical clues about the authenticity of Stradivari instruments were never made public to prevent advanced counterfeiting. Instead, such valuable knowledge has been passed down for generations as trade secrets within an international network of leading restorers/luthiers, appraisers, and curators, thereby ensuring market order and accountability.

It is well known in the violin community that almost every surviving Stradivari violin has been properly documented [10], and the probability of finding an authentic Stradivarius in an attic or a flea market is nearly zero. While the analytical tests performed by Sandu et al. may help establish that an instrument is old (>100 years) [1,2], they do not provide forensic clues that could help authenticate a Stradivarius. On the other hand, dendrochronology, when carefully and correctly conducted, could provide valuable supporting evidence to assist instrument identification [11–13]. In recent years, extensive databases of spruce tree ring patterns from historical Cremonese violins have been established. It is now possible to show that two Stradivari violins were made from the same tree or that a Stradivari and a Guarneri instrument used trees from the same forest region. Recently, a previously undocumented Guarneri violin was authenticated by Bruce Carlson, an internationally recognized expert, and corroborated by dendrochronology dating [11].

3. Tracing Research Samples from Historical Instruments

Demonstrating that research samples were actually taken from a historical violin can be tricky at times. Ideally, one could record a video of the sampling process from the authenticated historical instrument. For instance, in a study of antique Chinese guqin zithers, we visited a renowned private collector and took videos and photographs of him chiseling out wood chips from opened instruments [14]. Radiocarbon dating of these guqin wood samples provided useful information for instrument authentication, sometimes supporting or refuting the original assumptions about the provenance [14]. However, radiocarbon dating is only helpful for instruments older than 500 years, not applicable even to the oldest of violins by Andrea Amati (c. 1550).

With a 400-year-old Amati viola, the expert luthier who generously saved the wood shavings for our study also sent us a series of photographs documenting the restoration process [5]. The provenance of this historic viola could be traced all the way back to the Medici family. In another case, the neck of a Stradivari violin was generously loaned to us by the Chimei Museum, which hosts the largest collection of Old Italian violins in the world. We were permitted to extract wood samples from this neck in our laboratory [15]. Although it is not possible to authenticate a violin neck without the scroll (replacing the neck of Stradivari violins was standard practice in their modernization process), the Chimei Museum originally acquired this piece from a credible source. Interestingly, this neck maple sample contains extraordinary levels of NaCl, which is also found in another Stradivari violin maple sample and a Stradivari cello spruce sample. In comparison, another piece of

old maple installed to extend this neck does not contain extra salt. This gives us additional confidence that the neck came from a genuine Stradivarius [5].

Some of the Stradivari and Guarneri wood samples we previously analyzed came from restorations carried out by René Morel and Guy Rabut. Both were reputed luthiers based in New York, trusted by clients with valuable historical instruments [5,15]. They were qualified to judge the authenticity of Stradivari instruments because they had the privilege to open them for inspection. These samples reached us in small plastic bags sent by leading violin researchers who previously investigated Stradivari instruments—Joseph Nagyvary [16] and Brigitte Brandmair [17]. We had no direct proof of their association with the original instruments, but we accepted these samples in good faith. By infrared spectroscopy, we could only verify that they were aged wood samples (>100 years) [5,15].

4. Conclusions

From the examples above, we would like to emphasize that researchers should not place blind faith in the authenticity of antique string instruments. One must exercise due diligence and critically evaluate the provenance of historical instruments, in accordance with accepted norms of museum curation and public auctions. When in doubt, it is important to consult qualified experts in the music community. In our experience, expert luthiers, restorers, museum curators, and reputable dealers are often willing to share professional opinions regarding the works of famous Cremonese makers. In this internet age, almost all surviving instruments of the Amati, Stradivari, and Guarneri families have been documented, leaving very few surprises. Hence, it should not be difficult to trace research samples to specific instruments from these famous makers. Sometimes, a researcher may choose not to fully disclose instrument identity in a publication if the owner requests anonymity or if the report may potentially affect commercial value (for instance, a prominent wolf note is recorded or a significant repair is documented). Historical instrument research usually requires the generosity of the owners, and their potential interests should also be respected.

The violin community has become increasingly open to scientific inquiry since the turn of the millennium. We expect to see many fruitful collaborations between violin experts and interested researchers in the future.

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References

1. Sandu, I.; Tănasă, P.O.; Brînză, F.; Vasilache, V.; Drob, A.; Drobotă, V. Authentication of a Stradivarius “Petite Violin” Type from 1723. *Appl. Sci.* **2023**, *13*, 1048. [\[CrossRef\]](#)
2. Sandu, I.; Tanasa, P.O.; Sandu, I.C.A.; Negru, I.C.; Sandu, A.V.; Vasilache, V. Authentication of an old violin by multianalytical methods. *Appl. Sci.* **2019**, *10*, 306. [\[CrossRef\]](#)
3. Tai, H.C.; Shen, Y.P.; Lin, J.H.; Chung, D.T. Acoustic evolution of old Italian violins from Amati to Stradivari. *Proc. Natl. Acad. Sci. USA* **2018**, *115*, 5926–5931. [\[CrossRef\]](#) [\[PubMed\]](#)
4. Tai, H.C.; Chung, D.T. Stradivari Violins Exhibit Formant Frequencies Resembling Vowels Produced by Females. *Savart J.* **2012**, *1*, 16.
5. Su, C.K.; Chen, S.Y.; Chung, J.H.; Li, G.C.; Brandmair, B.; Huthwelker, T.; Fulton, J.L.; Borca, C.N.; Huang, S.J.; Nagyvary, J.; et al. Materials Engineering of Violin Soundboards by Stradivari and Guarneri. *Angew. Chem. Int. Ed. Engl.* **2021**, *60*, 19144–19154. [\[CrossRef\]](#) [\[PubMed\]](#)
6. Hill, W.H.; Hill, A.F.; Hill, A.E. *Antonio Stradivari: His Life and Work (1644–1737)*; Dover: New York, NY, USA, 1902.
7. Pollens, S. *Stradivari*; Cambridge UP: Cambridge, UK, 2010.
8. Sacconi, S.F. *The Secrets of Stradivari*; Libreria del Convegno: Cremona, Italy, 1979.
9. Ward, R. The Mystery of Origin. *Strings Magazine*, October 2005, pp. 73–79.

10. Morris, S.; Smith, S. *Antonio Stradivari: The Complete Works*; Beares Publishing: London, UK, 2024.
11. Bernabei, M. A Guarneri violin in the attic: The power of dendrochronology for analysing musical instruments. *Herit. Sci.* **2021**, *9*, 47. [[CrossRef](#)]
12. Cherubini, P. Tree-ring dating of musical instruments. *Science* **2021**, *373*, 1434–1436. [[CrossRef](#)] [[PubMed](#)]
13. Mauro, B.; Jarno, B.; Luigi, S. Dendrochronological analysis of the Stradivari's harp. *Dendrochronologia* **2022**, *74*, 125960. [[CrossRef](#)]
14. Cai, W.; Cheng, Y.-K.; Tseng, H.-H.; Tai, H.-C.; Lo, S.-F. Identification and characterization of wood from antique Chinese guqin zithers. *J. Cult. Herit.* **2022**, *53*, 72–79. [[CrossRef](#)]
15. Tai, H.C.; Li, G.C.; Huang, S.J.; Jhu, C.R.; Chung, J.H.; Wang, B.Y.; Hsu, C.S.; Brandmair, B.; Chung, D.T.; Chen, H.M.; et al. Chemical distinctions between Stradivari's maple and modern tonewood. *Proc. Natl. Acad. Sci. USA* **2017**, *114*, 27–32. [[PubMed](#)]
16. Nagyvary, J.; DiVerdi, J.A.; Owen, N.L.; Tolley, H.D. Wood used by Stradivari and Guarneri. *Nature* **2006**, *444*, 565. [[CrossRef](#)] [[PubMed](#)]
17. Brandmair, B.; Greiner, S.P. *Stradivari Varnish: Scientific Analysis of His Finishing Technique on Selected Instruments*; Brigitte Brandmair and Stefan-Peter Greiner: Munich, Germany, 2010.

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