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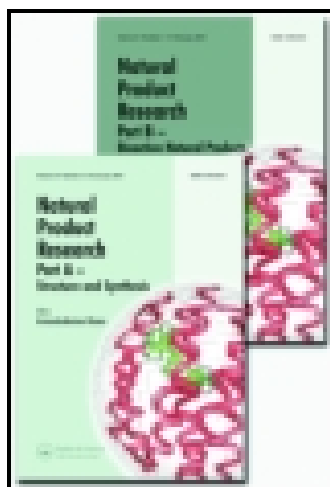
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Published online: 23 Jan 2015.



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To cite this article: Erdoğan Pazar & Yurdanur Akgül (2015): Chemical composition of the endocarps of fruits of *Styrax officinalis* L., *Natural Product Research: Formerly Natural Product Letters*, DOI: [10.1080/14786419.2014.1003063](https://doi.org/10.1080/14786419.2014.1003063)

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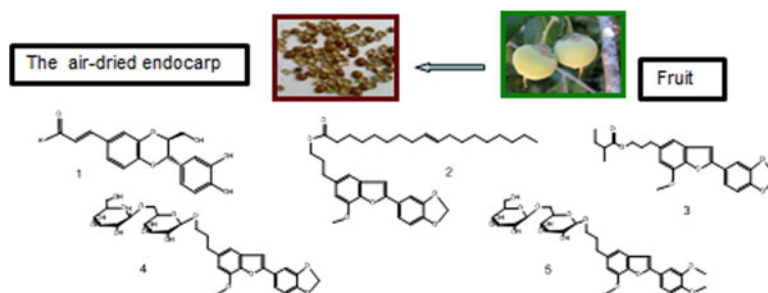
SHORT COMMUNICATION

Chemical composition of the endocarps of fruits of *Styrax officinalis* L.

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(Received 18 November 2014; final version received 21 December 2014)



Endocarps of fruits of *Styrax officinalis* L. have been subjected to a phytochemical investigation. Five compounds, americanin A (**1**), egonololeat (**2**), egonol-2^{'''}-metil butanoat (**3**), egonolgentiobiside (**4**) and homoegonolgentiobiside (**5**) were isolated. Their structures were elucidated by using spectroscopic methods and comparison with the literature data. This is the first report of the presence of compound **1** and compound **2** in the genus *Styrax* (Styracaceae family) and *S. officinalis* L. species, respectively.

Keywords: *Styrax officinalis* L; Styracaceae; Americanin A; egonololeat; chemical constituents

1. Introduction

The genus *Styrax* (Styracaceae), mainly distributed in tropical and subtropical regions, is comprised of about 130 species. *Styrax officinalis* L. is native to southern Europe and the Middle East (Fritsch 1999). The resin of the species *S. officinalis* L., known as storax, was used in traditional medicine in the Mediterranean basin for antiseptic purposes and against respiratory diseases. Previous phytochemical investigations on the *S. officinalis* L. have revealed the presence of benzofurans (Segal et al. 1967; Anil 1980; Akgül & Anil 2003), lipids (Ulubelen et al. 1976) and saponins (Anil 1979; Yayla et al. 2002) of *S. officinalis* L. However, no chemical studies on the endocarps of fruits of this plant have been reported.

In the course of our phytochemical investigations on the endocarp of fruits, americanin A (**1**, which exhibited both DPPH radical-scavenging and tyrosinase inhibitory activities, Megumi et al. 2009), egonololeat (**2**, which significantly inhibited both EeAChe and hACHe activities, Jiawei et al. 2011), egonol-2^{'''}-metilbutanoat (**3**), egonolgentiobiside (**4**) and homoegonolgentiobiside (**5**) were isolated. This is the first report of the presence of compound **1** and compound **2** in the genus *Styrax* (Styracaceae family) and *S. officinalis* L., respectively.

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2. Results and discussion

Americanin A (**1**) was first isolated from *Phytolacca americana* in 1978 by Woo et al. (family: Phytolaccaceae). Also, it was isolated from *Phytolacca thyrsoiflora* (Mitsue et al. 1988). In this study, it was isolated as a pale yellow solid. The structure of **1** was confirmed by using ^1H , ^{13}C , COSY, NOESY, HMBC, HMQC and HR-ESI-MS experiments and by comparison with those of the literature data (Woo et al. 1978; Antus et al. 1986; Bao-Ning et al. 2005, Figure S1–S9 and Table S1). Co-occurrence of the neolignan Americanin A (**1**) could be chemotaxonomically important and might serve as a chemotaxonomic marker for both Styracaceae and Phytolaccaceae families.

Egonololeat (**2**) was obtained as a pale yellow oil from *S. officinalis* L. for the first time. Also, it was isolated as a natural product from *Styrax agrestis* in 2011 (Jiawei et al. 2011) and synthesised from egonol as a semi-synthetic compound (Öztürk et al. 2008). The compound was identified by comparing its spectroscopic data with those reported in the literature (Figure S10–S13).

Compound **3** was isolated as a solid. The known compound was identified by comparing its spectral data with the values in the literature (Takanashi & Takizawa 1988; Akgül & Anil 2003).

Compounds **4** and **5** were obtained as a mixture of pale yellow oil. The compounds were identified by comparing their spectral data with the values in the literature (Anil 1980).

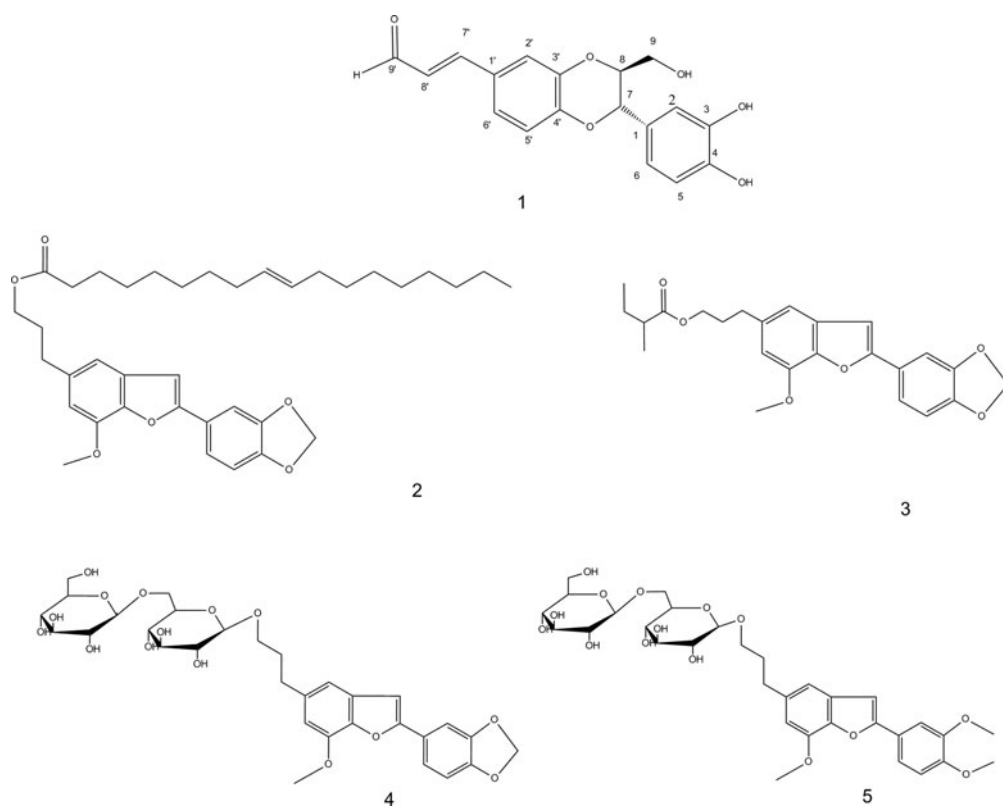


Figure 1. Structure of isolated compounds (1–5).

3. Conclusion

This study provides data on the isolation of one neolignan, two esterbenzofurans and two benzofurangelcosides (Figure 1). This is the first report of the presence of compound **1** and compound **2** in the genus *Styrax* (Styracaceae family) and *S. officinalis* L., respectively.

Supplementary material

Supplementary material relating to this article is available online, alongside Figure S1–S13, Experimental details and Table S1.

Acknowledgements

The authors thank Prof. Stephen T. Astley for proofreading the manuscript.

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