Abstract

Abstract Robinia pseudoacacia L. heartwood is characterized by a very high natural durability. However, a significant difference was observed between the mature and juvenile heartwood, the latter presenting less durability against fungi decay, which could be attributed to lower extractive content. In order to elucidate this idea, extractives from mature and juvenile heartwoods of black locust trees were investigated. Results showed that extractive and phenolic contents were higher in mature than in juvenile heartwoods. The identification of phenolic compounds by UPLC–DAD–MS/MS revealed, for the first time, the presence of resveratrol and piceatannol. These two stilbenes as well as the flavonoid dihydrorobinetin were present at the highest level in mature heartwood, and as they are known antifungals, they could account for the great durability of mature heartwood. The stilbenes were detected in significant amounts particularly in mature heartwood where piceatannol reached a level tenfold higher than that reported for Japanese knotweed roots, the primary natural source of these stilbenes, whereas resveratrol level was comparable with reported values. As resveratrol and piceatannol receive increasing demand for nutraceutical, cosmetic and, possibly, pharmaceutical purposes, due to their beneficial health effects, this study underlines the use of R. pseudoacacia as a promising sustainable and economical source of resveratrol and piceatannol.