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Analytical approaches for studies of fossil resins

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Highlights

- Review provides an updated summary of analytical methods used in studies of fossil resins.
- Review presents advantages and disadvantages of analytical methods currently applied in studies of fossil resins.
- Review presents, trends, expectation in future development of analytical methods .

Abstract

Knowledge on fossil resins (including amber and all their various types) has started to develop significantly since the second half of the 20th century mainly due to advancement of analytical methods and equipment. Nowadays, many researchers are focused on investigation of the resin due to not only their decorative appearance and its utilization in jewelry but also unique physicochemical features which are not fully explore yet. Some of those features may have a health benefit for human body. The fossil resins are organic material with polymeric nature, very similar in appearance to artificial or natural plant resin. Hence, the fossil resins are often adulterated with the modern resin. Moreover, some very rare and precious fossil resin specimens are imitated by more abundant, cheaper fossil specimen (for example succinite - Baltic amber is often imitated by copal). Therefore, there is a need to characterize these materials and find unique physicochemical features that allow to identify and classify them. Additionally, physicochemical characterization of fossil resins may also discover serendipitously some information about plant and animal evolution, climate change, geological and environment conditions in the past. In this paper, authors review various approaches for characterization, classification of the fossils, finding their provenance, origin and adulteration.

Key words: fossil resins, identification, characterization, classification, analytical methods

Introduction

Fossil resins are products of deciduous and coniferous trees formed millions years ago. The fact that the resins survived until the present day is due to appropriate processes and conditions. One of them is the ability of plant secretions to polymerize. There are types of chemical structures that from the original plant secretions formed polymerized or macromolecular connection resistant to various environmental factors. Fossil resins owe these factors wide application in jewelry. The polymerization process gives property of better susceptibility to mechanical machining.

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