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Wood Protecting Chemicals

Potential valorization of wood extractives from waste products of steam distillation of *Aniba rosaeodora*: antitermitic activity

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Abstract

Aniba rosaeodora, is a slow growing evergreens of the Lauraceae family which are indigenous over a wide range of the Greater Amazon Region (the Guianas and Venezuela, Brazilian Amazon...). The essential oil obtained from the wood has a characteristic aroma and is a long-established ingredient in the more expensive perfumes. The wood is also composed with alkaloid compounds like anibin. These compounds contribute to the protection of the wood against insects and fungi. This work is focused on the valorization of steam distilled sawdust; the sawdust was extracted with methanol in order to study the antitermitic activity of the extract. The methanolic extract shows an efficacy against termites at low concentrations according to the EN 117 standard.

Keywords

Aniba rosaeodora – antitermitic – european standard – screening test.

Introduction

Rosewood, *Aniba rosaeodora* (also known as Rosewood, Pau-rosa and Palo de Rosa) is a slow-growing hardwood (30 m height meter and trunk diameter at breast height of two meters). It is one of about 40 members of the Neotropical genus *Aniba* and occurs in dense primary wet tropical rainforest at medium and high altitudes in Brazil, Colombia, Ecuador, French Guyana, Guyana, Peru, Suriname and Venezuela. *Aniba* species belong to the Lauraceae family and most of them possess aromatic roots, stems and fruits. Rosewood has been extensively felled to harvest its wood which is rich in linalool oil, valued as a fragrance in top-of-the-range perfumes, as a component in a wide range of scents and in aromatherapy (May and Barata, 2003). The oil, which is chiefly extracted from the wood by Hydrodistillation, is rich in linalool, and used as a fragrance in fine perfumes and as a perfume fixative. The essential oil is composed more than twenty molecules but linalol is the major compound (90 % of the mixture, Vial Debas, 1996).

In French Guiana, in the last century (1885 -1975) the industry of rose wood essential oil was flourishing but progressively the activity declined because of the over exploitation of the resource (Bruleaux, 1990). Today, Brazil is the only producer of *A. rosaeodora* essential oil, which is derived almost entirely from natural stands It

is declining as well, and a new thought about rosewood culture and sustainable exploitation could be pertinent. Since 2011, *Aniba rosaeodora* is inscribed on the list II appendix II of Washington Convention on international trade in endangered species of wild flora and fauna. So in French Guiana, several projects are developed to develop essential oil production according to sustainable conditions. Wood from *Aniba rosaeodora* is composed with other family compounds like alkaloid, for example anibin (Mors et al, 1957). This family chemical is well-known for its bioactivity; particularly against fungi and insects (Abad et al., 2007). The aim of this paper is to study the fungicidal activity of methanolic extracts in order to propose new way of waste valorization.

Methodology

An adult tree was selected (*Aniba rosaeodora*). The wood samples were ground to 0.5 mm of size of the particles in a Retsch ZM 200 mill. The sawdust was extracted with methanol (1/5) during 12 hours in cold conditions. The methanolic extract was tested against termite (*Reticulitermes flavipes*) according to the screening test (Harun and al, 1985), EN 118 (Afnor, 2005) and EN 117 (Afnor, 2005) European standards.

Results

The yield of methanolic extract of the wood tree is equal to 3.6 %. With the screening tests, all the termites died after 24h exposure. The standardized tests showed that the threshold efficacy is between 43 and 50% according to the EN 118 bioassay while it is under 5% according to the EN 117 bioassay. For the EN 117, bioassay, all the termites died after 8 weeks exposure.

Conclusion

This study illustrates, the antitermitic activity of methanolic extract against termites and there is some molecules like anibin with play a key role in the resistance mechanism.

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