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SYNTHESIS OF LOW-ABUNDANCE SESQUITERPENOIDS FROM β CARYOPHYLLENE

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β -Caryophyllene is one of the most abundant sesquiterpenes found in nature, therefore it is available at low price from several commercial sources. The unusual structure of β -caryophyllene with two stereodefined chiral centers renders this terpene an attractive renewable starting material for the access of diverse high value compounds.

We demonstrate that β -caryophyllene and its oxide can be used in synthesis of biologically active sesquiterpene lactones rumphellaones A-C [1], disesquiterpenoid rumphellolide J [2], and linariophyllene B (scheme 1). In our ongoing research we show that rare structural units, such as propellane **1**, bridgehead olefins **2a,b** and epoxides **3a,b** (scheme 1) can be prepared from β -caryophyllene in a stereoselective fashion [3]. Such compounds can serve as reference standards for the analysis of constituents of various plant extracts. The biomimetic transformations employed in several chemical steps elucidate the possible biosynthetic route towards natural sesquiterpenoids. Structures of final products were unambiguously confirmed by single crystal X-ray diffraction analysis.

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