

Synthesis and structural determination of new brassinosteroid

24-nor-5 β -cholane type analogs

Oyarce J.

Aitken V.

González C.

Ferrer K.

Olea A.F.

Parella T.

Catalán L.E.

Natural brassinosteroids possess a 22R, 23R configuration that appears essential for biological activity. It is, therefore, interesting to elucidate if the activity of brassinosteroids with a short side chain depends on the C22 configuration. Herein, we describe the synthesis of new brassinosteroids analogs with 24-norcholane type of side chain and R configuration at C22. The initial reaction is the dihydroxylation of a terminal olefin that leads to S/R epimers. Three different methods were tested in order to evaluate the obtained S/R ratio and the reaction yields. The results indicate that Upjohn dihydroxylation is the most selective reaction giving a 1.0:0.24 S/R ratio, whereas a Sharpless reaction leads to a mixture of 1.0:0.90 S/R with 95% yield. Using the latter mixture and following a previous reported method, benzoylated derivatives and both S and R brassinosteroids analogs were synthesized. All synthesized compounds were completely characterized by NMR spectroscopy, and HRMS of new compounds are also given. In conclusion, a synthetic route for preparation of new analogs of brassinosteroids of 24-norcholane type and R configuration at C22 were described. It is expected that this will help to elucidate if a configuration at C22 is a structural requirement for hormonal growth activity in plants. © 2019 by the authors.

24-nor-5 β -cholane

Analogues

Brassinosteroid

Synthesis

brassinosteroid

cholane derivative

phytohormone

chemical structure

chemistry

hydroxylation

nuclear magnetic resonance spectroscopy

synthesis

Brassinosteroids

Chemistry Techniques, Synthetic

Cholanes

Hydroxylation

Magnetic Resonance Spectroscopy

Molecular Structure

Plant Growth Regulators