Biomimetic Synthesis of Phenylethanoid Alkaloids

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The phenylethanoids are a diverse group of shikimic acid derived natural products, characterised by the presence of a C_6C_2 moiety. These compounds are of great interest for their structural complexity and wide range of biological functions. Incargranine B is a dimeric phenylethanoid alkaloid, originally assigned an unprecedented indolo[1.7]naphthyridine structure. As a result of biosynthetic speculation, we proposed a dipyrroloquinoline core as a plausible alternative structure. Following a biomimetic strategy, the proposed structure of incargranine B was accessed in six steps, confirming the suggested structural revision and indicating the natural product likely exists as a mixture of two *pseudo*-enantiomeric diastereomers. Extending upon this biomimetic synthesis, we now propose a unified biosynthetic hypothesis for the entire family of phenylethanoid natural products isolated from plants of the genus *incarvillea*. Studies towards the biomimetic synthesis of millingtonine and incargranine A will also be presented.