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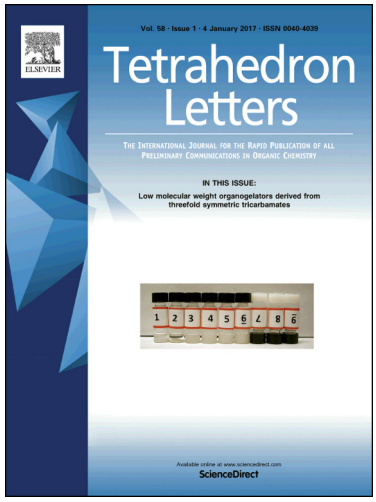

Two unusual isoflavonoids from *Campylotropis hirtella* -A new biosynthesis route of flavonoids

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Two unusual isoflavonoids from *Campylotropis hirtella*
-A new biosynthesis route of flavonoids

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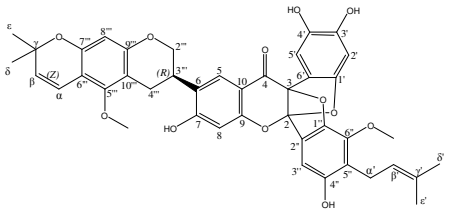
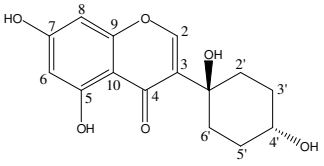
Abstract. Two unusual isoflavonoids were isolated from *Campylotropis hirtella*. Compound **1** is the first isoflavane-coumaronochromone discovered and contains a dimer with a unique propeller-like 3D structure. Compound **2** is an isoflavonoid with an unusual saturated B-ring. The relative configuration of compound **2** was determined by single crystal x-ray diffraction. We propose the biosynthetic pathway of compound **2** and hypothesize that this pathway may exist in parallel with the well-established phenylpropanoid pathway.

Key words. isoflavonoids; *Campylotropis hirtella*; biosynthesis; phenylpropanoid pathway

Flavonoids are "the most common group of polyphenolic compounds in the human diet and are ubiquitously found in plants[1]." The wide variety and distribution of flavonoids, together with their relatively low toxicity compared to other active plant compounds (for instance alkaloids), enables that many animals, including humans, ingest significant quantities of flavonoids. Although flavonoid structure elucidation is rapidly becoming a mature science, studies of their bioavailability and physiological activity in both animals and plants are likely to become the new frontier[2]. Understanding of their physiological activity and biosynthesis will undoubtedly lead to the more widespread application of flavonoids in the improvement of human health and in crop quality. Flavonoid biosynthesis is probably the best characterized of all the secondary metabolic pathways[3]. It is generally accepted that the flavonoid pathway is part of the larger phenylpropanoid pathway, which produces a range of other secondary metabolites, including phenolic acids, lignins, lignans and stilbenes. The key flavonoid precursors are phenylalanine, obtained via the shikimate and arogenate pathways, and malonyl-CoA, derived from citrate produced by the TCA cycle[2b]. The initial steps of isoflavonoid biosynthesis are already well characterized at the molecular level[4]. However, besides the phenylpropanoid pathway, it is not yet clear whether there are other routes for flavonoid biosynthesis. Herein, we report the isolation and identification of two unusual isoflavonoids from *Campylotropis hirtella* (Figure 1). The unique structure of compound **2** enabled us to propose a new flavonoid biosynthesis route which may exist in parallel with phenylpropanoid pathway.



Compound **1**



Compound **2**

‡ These authors contributed equally to this paper.