Lewis Acid Catalyzed Cascade Involving 5-*exo-dig* Cyclization: Modular Approach to Bioactive Neo-Lignan and Dimeric Reveratrol Scaffolds

Bidyut K. Dinda,[ζ] **Shyamal K. Bera**,[£] and Vishnumaya Bisai*[ζ]

[ζ]Department of Chemistry, Indian Institute of Science Education and Research Berhampur, Engineering School Junction, Berhampur - 760 010, Odisha and [£]Department of Chemistry, Indian Institute of Science Education and Research Bhopal, Bhopal Bypass Road, Bhopal – 462 066, MP (*E-mail:* vishnumaya@iiserbpr.ac.in)

Abstract:
Neo-lignan[1a] (**1**) and resveratrol derived natural products[1b] (**2-5**) are secondary metabolites which are widely spread and represent an enormous class of pharmacologically active compounds within the plant kingdom and are derived from the shikimic acid biosynthetic pathway. Resveratrol can undergo several structural modifications after its biosynthesis (**2-5**). Resveratrol oligomers, like many secondary metabolites, are chiefly expressed as biological defense compounds and occur as dimers (**3-4**), trimers, tetramers (**5**), and higher-order oligomers in plants.

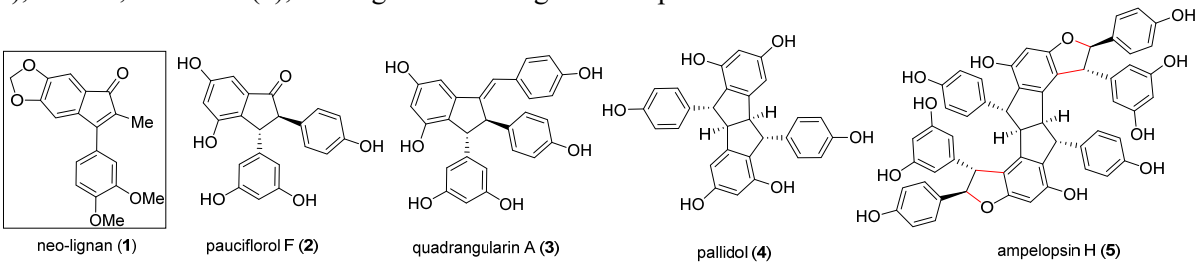
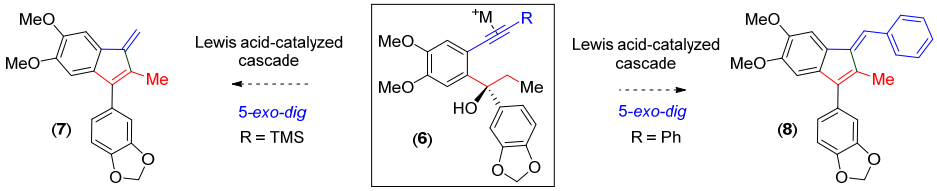


Figure 1. Selected bioactive neo-lignan and resveratrol based natural products.

Owing to their biological activities ranging from *anti*-oxidant, *anti*-tumor, *anti*-inflammatory to *anti*-viral properties,[2a] they have been used for a long time both in ethnic as well as in conventional medicine.[2b] Therefore, needless to say, there is growing interest for synthetic approaches to neo-lignan and resveratrol derived natural products of types **1-5** (Figure 1).[1b]



Scheme 1. Modular approach to 1-aryl-indene (**7-8**) via a cascade involving 5-*exo-dig* cyclization

We envisioned of a unified approach to neo-lignan and resveratrol based structural scaffolds via a Lewis acid catalyzed cascade involving 5-*exo-dig* cyclization of **6** (Scheme 1). In this poster, I will discuss our synthetic endeavors and the mechanistic considerations of this methodology, which provides concise entries to the structural scaffolds **7-8** required for these secondary metabolites having indene scaffolds.

References and Notes:

1. (a) Harrowven, D. C.; New, N. A.; Knight, C. A. *Tetrahedron* **1998**, *39*, 6757. (b) Review: Teponno, R. B.; Kusari, S.; Spiteller, M. *Nat. Prod. Rep.* **2016**, *33*, 1044.
2. (a) Li, W.; Li, H.; Li, Y.; Hou, Z. *Angew. Chem. Int. Ed.* **2006**, *45*, 7609. (b) Keylor, M. H.; Matsuura, B. S.; Stephenson, C. R. J. *Chem. Rev.* **2015**, *115*, 8976.
3. Dinda, B. K., Bera, S. K.; Bisai, V. *Work under progress.*