



# Epicolactone: a new natural product isolated from the fungus *Epicoccum nigrum*

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## Introduction

Endophytic fungi are a promising source of new natural products with a variety of biological activities. These microorganisms reside in living plants without causing damage and contributing to its protection by producing bioactive substances. Only a small fraction of the nearly 300,000 plant species on earth have been thoroughly studied relative to their endophytic microbes. Thus, bioprospecting endophytic microorganisms is considered an interesting strategy to isolate new molecules [1-2]. In the present work the fungus *Epicoccum nigrum*, isolated from the sugarcane, was investigated.

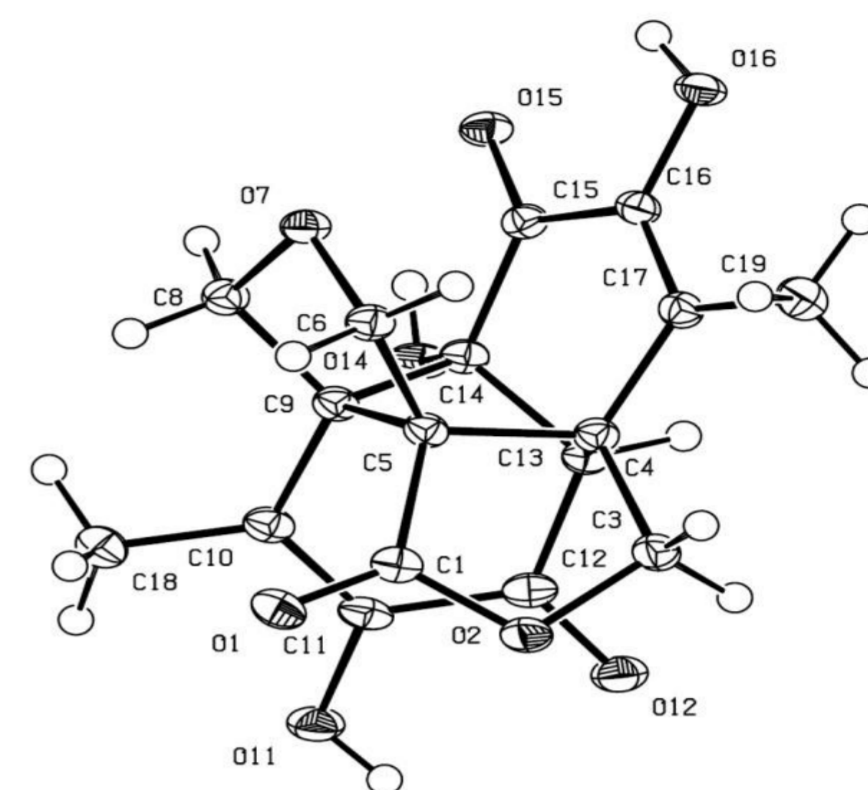
## Objective

To investigate the production of novel secondary metabolites by *E. nigrum*.

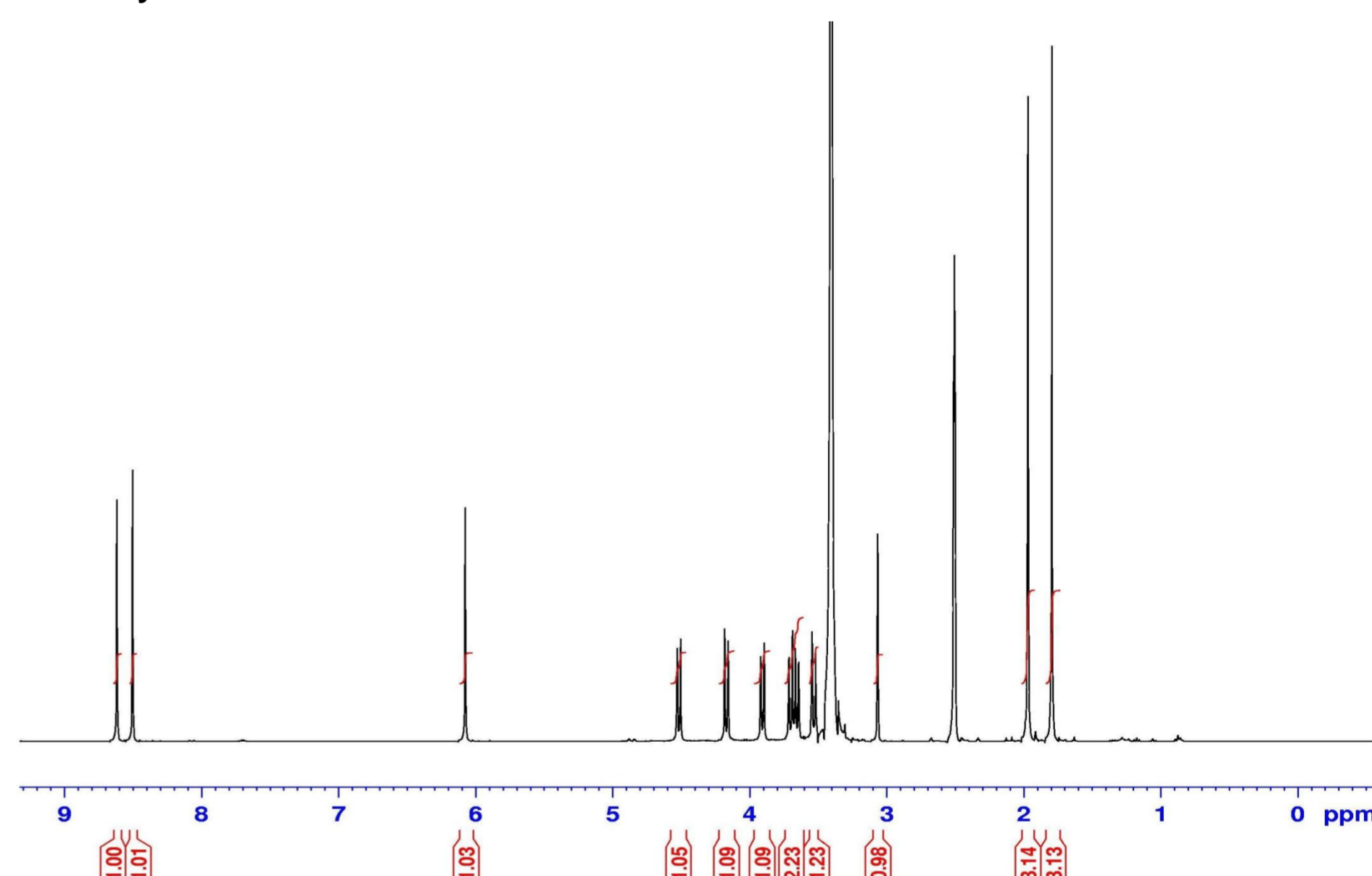
## Results and Discussion

Fungus *E. nigrum* was isolated from the sugarcane. The bioactivity-guided fractionation of secondary metabolites of the ethyl acetate extract of the culture both led to the discovery of the epicolactone. Several studies including NMR, MS and X-ray crystallography revealed that the epicolactone is a new natural product of unique skeleton.

Epicolactone (Figure 1) was isolated as white crystals and a molecular formula of  $C_{17}H_{16}O_8$  (10 insaturation degrees) was obtained based on HR-ESI-MS ( $m/z$  347.0748  $[M - H]^-$  for  $C_{17}H_{16}O_8$  347.0772). Spectroscopic characterization was achieved with 1D and 2D NMR ( $^1H$  and  $^{13}C$ ).



**Figure 1.** (a) Epicolactone structure. (B) ORTEP representation of the Epicolactone showing displacement ellipsoids drawn at the 50% probability level. H atoms are presented as a small spheres of arbitrary radius.



**Figure 2.**  $^1H$  NMR spectrum of the epicolactone (DMSO- $d_9$ , 400.13 MHz)

## Conclusion

Chemical studies of an ethyl acetate extract of the fungus *Epicoccum nigrum* led to isolation of the new natural product epicolactone. This molecule presented an inedited carbonic skeleton fully elucidated by X-ray crystallography and NMR methods.

## References

1. H. Yu, L. Zhang, L. Li, C. Zheng, L. Guo, W. Li, P. Sun and L. Qin, *Microbiol. Res.*, 2010, **165**, 437-449.
2. Strobel, G.; Daisy, B. *Microbiol. Mol. Biol. Rev.*, 2003, **67**, 491-502.