Preparation of 5-Deoxypterocarpens by α-Arylation of Tetralones with o-Bromo-methoxyarenes Followed by BBr₃ Mediated Cyclization

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INTRODUCTION

Pterocarpens are members of the family of isoflavonoids, natural products that are produced in response to microbial infections. It was reported that pterocarpens (1) and 5-deoxy-analogue (2), bind to estrogenic receptors (ERs) as strong as the natural ligand 17β-estradiol (Fig. 1).¹ These compounds were claimed to be useful for the treatment of cancer and other hormone-dependent diseases.

RESULTS AND DISCUSSION

The synthesis of desoxypterocarpens was started with the α-arylation of tetralones 3 with bromoarenes 4, catalyzed by Pd₂(dba)₃, under microwave irradiation (Scheme 1).

Under these conditions the α-aryltetralones 5 were obtained from good to high yields. The next step was the conversion of 5 into the 5-deoxypterocarperns through the one-pot demethylation-cyclization catalyzed by BBr₃ (Scheme 2). The products were obtained in high yields, without needing any process of purification. In the case of 5c-d the demethylation was chemoselective, and methoxy derivatives 7a-b were obtained only by keeping the reaction at 0 °C.

CONCLUSION

5-deoxypterocarpens were prepared in high yields through a two step synthesis: the α-arylation reaction of tetralones with o-bromoarenes, both commercially available, followed by the demethylation and cyclization catalyzed by BBr₃. Other α-aryltetralones are being converted into the corresponding deoxypterocarpens. These compounds are under pharmacological evaluation.

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REFERENCES