INTRODUCTION

Nucleosidic compounds containing a hydantoinic ring in their structure constitute an interesting group since the discovery of hydantocidin, a natural hydantoinic nucleoside. Particularly, there are different timidine analogs, obtained by a ring contraction strategy, with a five-membered heterocycle, namely methylhydantoin. For example, showdomicin is a broad-spectrum antibiotic isolated from *Streptomyces showdoensis*. In this context and supported by our previous experience in the synthesis of 1,2,2,3-tetrasubstituted cyclobutanic derivatives, the reactivity of methylcyclobutylketones and cyclobutanones to obtain hydantoinic compounds was studied.

RESULTS AND DISCUSSION

Intermediates 1a-d, 2a-d were prepared from (1S,5S)-α-pinene and (1S,5S)-(-)-verbenone (Scheme 1).

![Scheme 1. Synthetic pathway leading to hydantoinic nucleosides analogs.](image)

The reaction of precursors 1a-b and 2a-b with ammonium carbonate and potassium cyanide in a mixture of water and ethanol led to the obtention of the imidazolidinedionic nucleosides analogs 3a-b and 4a-b as a mixture in different proportions according to the position of the ketone group in the starting material. A noticeable prevalence for one of them was shown in the case of derivatives 4. Taking into account that the presence of an hydroximethyl group is mandatory in the development of nucleoside analogs, the reaction was assayed on the precursors 1c-d and 2c-d, also prepared from the precursors 1a-b and 2a-b respectively.

The results were compared within studied series with those previously obtained for the heterocyclation reaction of thiosemicarbazones, derived from the same precursors, leading to obtain Δ2-1,3,4-thiadiazolines.

CONCLUSION

As had been observed in heterocyclation reactions of cyclobutylmethylketones or cyclobutanones thiosemicarbazones leading to heterocyclic compounds, it could be observed that the differences in the proportions of the obtained products, within the exposed cases, are determined by the position of the sp2 carbon where the cyclization reaction occurs, with respect to the cyclobutanic ring chiral centers.

ACKNOWLEDGEMENTS

This work was supported by SECYT / University of Buenos Aires and CONICET (Argentina). J.A.C.K. is grateful to CONICET for a research fellowship.

REFERENCES

