A new approach to the synthesis of natural product Aripuanin

Aline Simões Lazaro1* (PG), Paulo Marcos Donate1 (PQ), Mirela Inês de Sairre2 (PQ).

1 Departamento de Química, Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo, Avenida Bandeirantes 3900, 14040-901, Ribeirão Preto, SP, Brazil.
2 Centro de Ciências Naturais e Humanas, Universidade Federal do ABC, Rua Santa Adélia 166, 09210-170, Santo André, SP, Brazil.

*alinese@pg.ffclrp.usp.br

Keywords: Ficus, Aripuanin, Synthesis.

INTRODUCTION

The sesquiterpene (3S,5R,6R,7E,9ξ)-megastigm-man-7-ene-3,5,6,9-tetrol, also known as Aripuanin (1), was isolated from the leaves of Ficus aripuanensis, which belongs to one of the main species of the Amazonian forest used in folk medicine for their several biological properties.1

![Figure 1. Structure of Aripuanin.](image)

In this work, we describe a new synthetic route for the preparation of natural product Aripuanin (1), as outlined in Scheme 1, starting from the readily available commercial β-ionone (2).

![Scheme 1. Preparation of the Aripuanin (1).](image)

RESULTS AND DISCUSSION

According to Scheme 1, the β-ionone (2) was submitted to a bromination reaction using N-bromosuccinimide (NBS) in carbon tetrachloride, under the heating of a tungsten lamp of 100 W. Treatment of the resulting bromide without further purification with sodium carbonate in dimethylformamide (DMF), furnished the compound 3 (67% yield). After, the diastereoselective synthesis of cis-3,6-dihydroxy-α-ionone (5) was performed from compound 3 with oxygen and a high-pressure sodium vapor lamp, in the presence of “Rose Bengal” as a photosensitizer.2 Subsequent addition of thiourea promoted the cleavage of the peroxy-derivative 4 to give the compound 5 (51% yield). The next step involved the epoxidation reaction of double bond in the cyclic system of 5 using meta-chloroperbenzoic acid (m-CPBA) in dichloromethane. This reaction furnished a mixture of diastereomers 6a and 6b (38% and 42% yield, respectively), which were separated by silica-gel column chromatography.

Now we are studying the ring-opening reaction of epoxide and simultaneous reduction of carbonyl group of compounds 6a and 6b, in order to obtain the desired compound 1.

CONCLUSION

The results obtained so far demonstrate the feasibility of this new synthetic route and indicate that the desired natural product 1 can be prepared successfully. Moreover, our goal is also to correctly assign the stereochemistry of the several stereogenic centers present in the natural product.

ACKNOWLEDGEMENTS

FAPESP, CAPES, CNPq.

REFERENCES

1 M. Nascimento et al.; Fitoterapia 1999, 70, 628.