Synthesis of (*R*/*S*)-2-hydroxy-5-methyl-hexan-3-one, sinomone issued by Araceae species: *P. acutatum* and *T. ulei*

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INTRODUCTION

In the northeast of Brazil, the strongly fragrant Araceae species: *Taccarum ulei* and *Philodendron acutatum* emit a floral scent called (*S*)-2-hydroxy-5-methyl-hexan-3-one ((***S*)-1**). This compound **(*S*)-1** is highly attractive to night active pollinators scarab beetles of the tribe Cyclocephalini (Figure 1).[1]

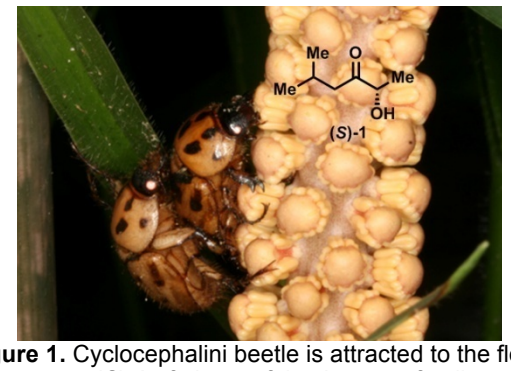
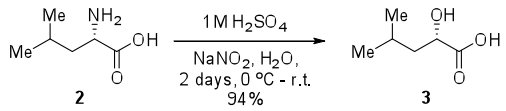


Figure 1. Cyclocephalini beetle is attracted to the floral scent **(*S*)-1** of plants of the Araceae family.

Herein, we describe the synthesis of the racemic acyloin **(*R*/*S*)-1** from the aminoacid *L*-leucine as starting material.

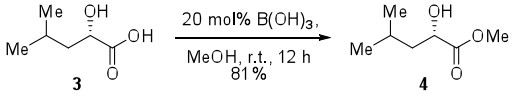
RESULTS AND DISCUSSION

Initially, the α-hydroxycarboxylic acid **3** was prepared by diazotization reaction of the commercially available *L*-leucine (**2**) in excellent yield (94%) (Scheme 1).



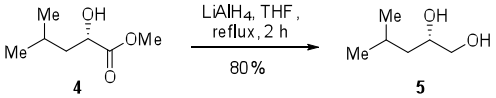
Scheme 1. Preparation of α-hydroxycarboxylic acid **3**.

The selective esterification of **3** using boric acid as catalyst, in methanol, at room temperature provided the α-hydroxyester **4** in 81% yield (Scheme 2).[2]



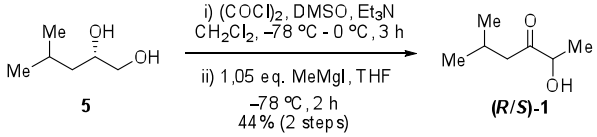
Scheme 2. Preparation of α-hydroxyester **4**.

The treatment of **4** with lithium aluminum hydride, under reflux, led to reduction of the carbonylic ester to provide 1,2-diol **5** in 80% yield (Scheme 3).



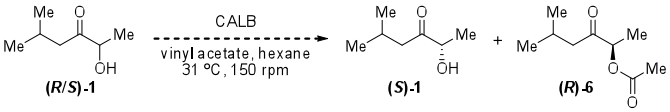
Scheme 3. Preparation of 1,2-diol **5**.

Finally, the 1,2-diol was oxidized under Swern conditions followed by 1,2-addition of MeMgI leading to **(*R*/*S*)-1**, in 44% yield over 2 steps (Scheme 4).



Scheme 4. Conclusion of racemic synthesis.

Currently in progress in the lab, is the enzymatic deracemization of compound **(*R*/*S*)-1** using the lipase CALB to obtain the floral scent (*S*)-α-hydroxyketone, **(*S*)-1** (Scheme 5).



Scheme 5. Preparation of acyloin **(*S*)-1**.

CONCLUSION

The synthesis of compound **(*R*/*S*)-1** was realized in 4 steps with 27% yield from *L*-leucine (**2**) as starting material.

ACKNOWLEDGEMENTS

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REFERENCES

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[2] Houston, T. A; Wilkinson, B. L Blanchfield, J. T. *Org. Lett.* **2004**, *6*, 679