

**Lightning and the thunder: insular dwarfism inferred from long bone histology of the titanosaurian *Atsinganosaurus velauciensis***

Jentgen, Benjamin Paul C; Stein, Koen; Díez Díaz, Verónica; Garcia, Géraldine; Valentin, Xavier; Fischer, Valentin

DOI:

[10.13140/RG.2.2.15528.01284](https://doi.org/10.13140/RG.2.2.15528.01284)

Publication date:

2018

Document Version:

Final published version

[Link to publication](#)

Citation for published version (APA):

Jentgen, B. P. C., Stein, K., Díez Díaz, V., Garcia, G., Valentin, X., & Fischer, V. (2018). *Lightning and the thunder: insular dwarfism inferred from long bone histology of the titanosaurian *Atsinganosaurus velauciensis**. Poster session presented at XVI meeting of the European Association of Vertebrate Paleontologists, Caparica, Portugal. <https://doi.org/10.13140/RG.2.2.15528.01284>

**Copyright**

No part of this publication may be reproduced or transmitted in any form, without the prior written permission of the author(s) or other rights holders to whom publication rights have been transferred, unless permitted by a license attached to the publication (a Creative Commons license or other), or unless exceptions to copyright law apply.

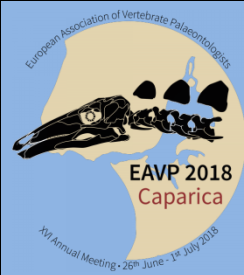
**Take down policy**

If you believe that this document infringes your copyright or other rights, please contact [openaccess@vub.be](mailto:openaccess@vub.be), with details of the nature of the infringement. We will investigate the claim and if justified, we will take the appropriate steps.

# Lightning and the thunder: insular dwarfism inferred from long bone histology of the titanosaurian *Atsinganosaurus velauciensis*

Jentgen-Ceschino B., Stein K., Díez Díaz V., García G., Valentin X. & Fischer V.

\*Corresponding author. e-mail : bjentgen@uliege.be

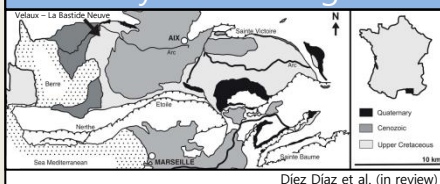


## Abstract

Titanosaurian sauropods include the largest land animals that ever walked on Earth. However, some of them evolved into dwarfed species, linked to their insular habitats. Here, we report on the long bone histology of several mature individuals of the small-sized titanosaur *Atsinganosaurus velauciensis* (García et al., 2010) from the Upper Cretaceous of Velau – La Bastide Neuve (Provence, South-Eastern France). The completely remodelled H bone tissue type in all specimens characterizes mature and fully grown individuals. Together with the extensive bone remodelling, the samples record HOS (Histological Ontogenetic Stages) 14 and range from RS (Remodelling Stages) 13 to 14.

Considering the reduced size of the sampled femur and humeri, the remodelling process would have begun early in the ontogeny of this titanosaur compared to non-titanosaurian sauropods, at a rate that surpassed the apposition rate. Thus, size reduction of *A. velauciensis* has to be taken into account to explain the advanced state of its long bone histology. Insular dwarfism is a consistent hypothesis for this combination of features and has been proposed for a series of other titanosaurs from the European archipelago (e.g. the Romanian *Magyarosaurus dacus* and the Spanish *Lirainosaurus astibiae*) that show comparable long bone histology and inferred body size.

## Heavy remodelling in the insular sauropod *Atsinganosaurus velauciensis*



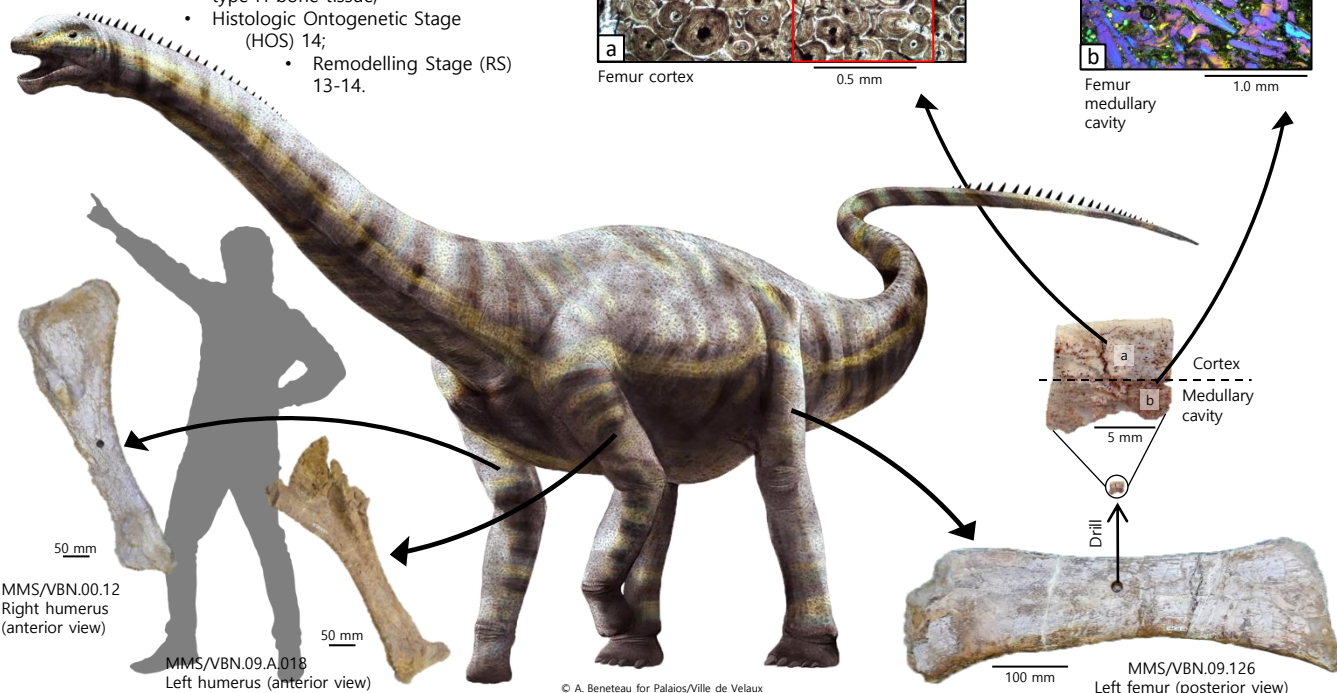
Díez Díaz et al. (in review)

### Sampling by core drilling of 2 humeri + 1 femur:

- MMS/VBN.09.A.018, .00.12 & .09.126

### Main osteo- and histological features:

- short propodials (humeri: 470 – 555 mm; femur: ca. 570 mm);
- cortex completely remodelled;
  - type H bone tissue;
  - Histologic Ontogenetic Stage (HOS) 14;
  - Remodelling Stage (RS) 13-14.



## Conclusions

1. Heavy remodelling indicates that the individuals of *Atsinganosaurus velauciensis* were fully grown adults at death;
2. The markedly small propodials (humeri: 470 – 555 mm; femur: ca. 570 mm) of *Atsinganosaurus velauciensis* and its paleogeographic range within the southern part of the European archipelago suggest that this taxon represents an additional case of insular dwarfism within titanosaurs.

## Acknowledgements

