A forest of sigmoidalistic monsters: Part 1: phenotypic description

Plomion C [1]

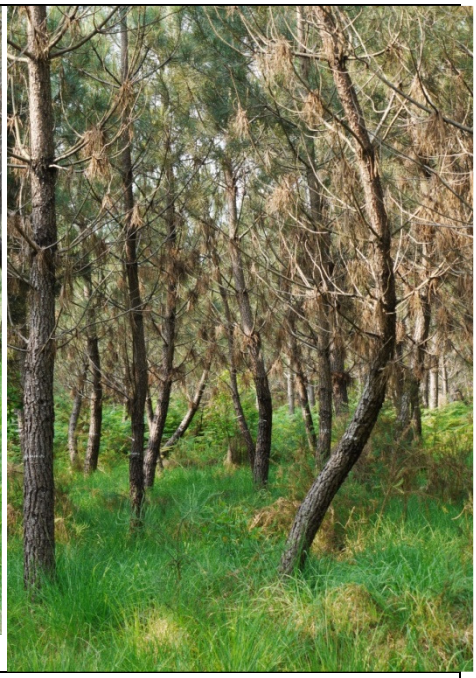
[1]: Bio-gecho, Landes pampa

Abstract : This paper describes a series of genetic monsters[1] created by crossing straight and sigmoidal maritime pine trees.

Introduction
This is the first report of such phenomenon in trees...to our best knowledge of course!!

Materials and Methods
Simple genetic manipulation....cannot say more...

Results
image speaks for itself.



[1] no transgenics were produced in this experiment...so José don't cut my trees!!

Figure 1: Genetically manipulated forest (somewhere...in the Landes pampa)**.** See the remarkable segregation obtained by this genetic manipulation

The basic statistics for stem straightness (ST, deviation from verticality) are indicated in supp file 1. Although skewed, the distribution of the trait clearly shows the presence of transgressive genotypes, so called "sigmoid phenotype". Data for two growth traits are given for comparison purpose. Note the extremely high CVp for ST! We are aware that such high value will probably make Dr. S. Delzon Jealous. Indeed compared to P50, ST presents a 10-fold increase in CVp making it a perfect trait for breeding for ornamental varieties in the year to come. Resistance to the pine wood nematode will have to be checked to evaluated the sustainability of the sigmoid forest. According to preliminary studies and feedback from users (Hugo Plomion, 6 yo) the ecological services provided by Sigmoid forest are expected to be high...Their impact on the forestry wood chain remains to be assessed.

Discussion

you wonder of course about the hydraulic properties of these trees...Part 2 (after the evaluation of the EFPA division....) will provide some answers to this key question....suspense...

This being said, we urge the reader to carefully check the following references (can be retrieved at http://herve.cochard.free.fr/) that will provide essential background to understand the next chapter of this story.

Cochard et al 1992, Cochard et al 1993, Cochard et 1994, Cochard et al 1995,
Cochard et al 2013 (new insights in tree monsters: a comment on the paper by Plomion, JSPH 0002).

The double inversed signmoidal phenotype, also called in the corridor of the cavitron facility the double S phenotype, is inspiring and deserve more in depth analysis. Annabel Porté, a well known specialist of the double S phenotype will provide some clues about this issue in the next issue of the Journal.

Acknowledgements
Two non anonymous reviewers, A Porté and G Le Provost, for certifying the uniqueness of these trees...and for supporting tons of mosquitoes .
Franck Zappa for kepping me awake at night.

References

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Cochard H, Peiffer M, Le Gall K, Granier A 1997. Developmental control of xylem hydraulic resistances and vulnerability to embolism in Fraxinus excelsior L. Impacts on water relations. Journal of Experimental Botany 48: 655-663.

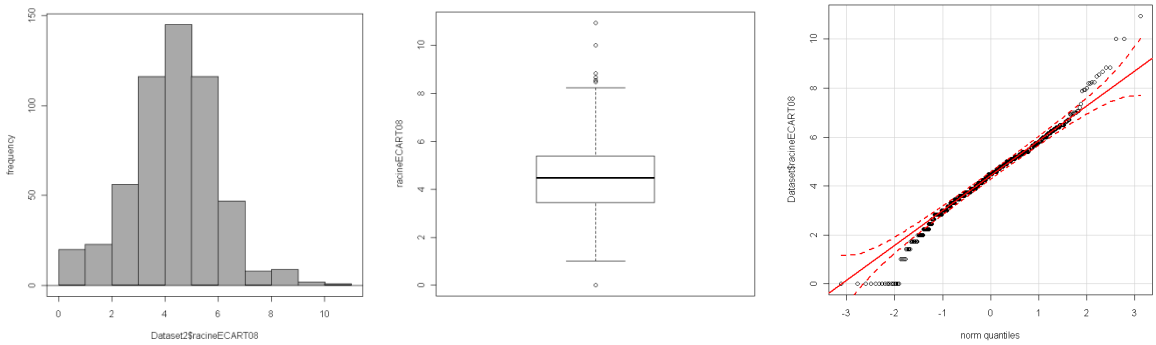
Cochard H, Lemoine D, Dreyer E 1999. The effects of acclimation to sunlight on the xylem vulnerability to embolism in Fagus sylvatica L. Plant, Cell and Environment 22: 101-108.

Cochard H, Delzon S 2013. Revisiting sap ascent in plants. Journal of Sigmoidal Plant Hydraulics 1 : e0001

Cochard H, Delzon, S 2013. new insights in tree monsters: a comment on the paper by Plomion, JSPH e0003.

Supp file 1:

Stem straightness (Root-squared transformed data)



	CIRC10	HT10	ECART08	logECART08	rtsqECART08
Kolmogorov-Smirnov: D (p-value)	1 ($<2.2e^{-16}$)	1 ($<2.2e^{-16}$)	0.95 ($<2.2e^{-16}$)	0.7 ($<2.2e^{-16}$)	0.9($<2.2e^{-16}$)
Shapiro-Wilk: W (p-value)	0.99 (0.0001)	0.96 ($6.5e^{-06}$)	0.88 ($<2.2e^{-16}$)	0.94($1.24e^{-13}$)	0.98 ($1.35e^{-07}$)

*: p-value > 0.05: Ho accepted- the trait display normal distribution

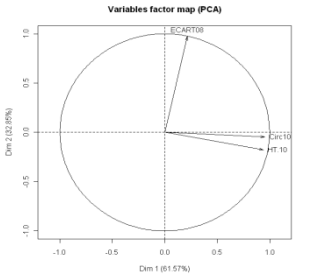
Classical statistics for three traits

Traits	Mean (M)	Standard Deviation (SD)	CVp	Min	Max	N
ECART08	21.97421	14.9941956	0.68235402	0	120	543
HT10	722.86654	98.9859463	0.1369353	370	1020	532
CIRC10	464.27941	103.782013	0.22353352	157	700	544

Pearson correlations for 3 traits (below diagonal) and associated p-values (above diagonal).

	Circ10	ECART08	HT.10
CIRC10		0	0
ECART08	0.18		0.2506
HT.10	0.82	0.05	

Correlation circle in the main plane (F1xF2) of the principal component analysis for 3 traits.


Variables factor map (PCA)
ECART08
Circ10
HT 10
Dim 2 (32.85%)
Dim 1 (61.57%)
1.0
0.5
0.0
-0.5
-1.0
-1.0
-0.5
0.0
0.5
1.0