buttRflyfish: reproduction of figure 2b from Nowicki et al. 2020

Gabriel A. Preising1,✉, Tatiana Bellagio1, and Sebastian ToroArana1,✉

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1 Stanford University Biology Department

✉ Correspondence: [Gabriel A. Preising <[gpreisin@stanford.edu](mailto:gpreisin@stanford.edu)>](mailto:gpreisin@stanford.edu), [Sebastian ToroArana <[sebatoro@stanford.edu](mailto:sebatoro@stanford.edu)>](mailto:sebatoro@stanford.edu)

# 1 Introduction

Here, we reproduce figure 2b from (Nowicki et al., 2020) - “Gene expression correlates of social evolution in coral reef butterfly fishes.” This study analyzed the neural correlates of pair-bonding vs. solitary mating behavior in several species of *Chaetodontidae* fishes. To accomplish this, they compared gene expression of socially-relevant neuropeptides in brain regions pertinent to social function. One of their main findings was that the males of pair-bonding species had elevated oxytocin receptor (OTR) expression in the supracommissural part of the ventral telencephalon (Vs) compared to the males of solitary species.

# 2 Methods

The authors of (Nowicki et al., 2020) used qRT-PCR to quantify relative mRNA expression of OTR in Vs of 5 *Chaetodontidae* species: *C. vagabundus*, *C. lunatus*, *C. baronessa*, *C. trifascialis*, and *C. rainfordi*. They employ a Markov Chain Monte Carlo approach to analyze differential gene expression. Below is a reproduction of figure 2b using our package buttRflyfish.

# 3 Results

library(buttRflyfish)  
  
data = load\_data() # load data  
model = run\_model(data) # run MCMC model  
p = otr\_expression\_plot(model,data) # plot differential expression results

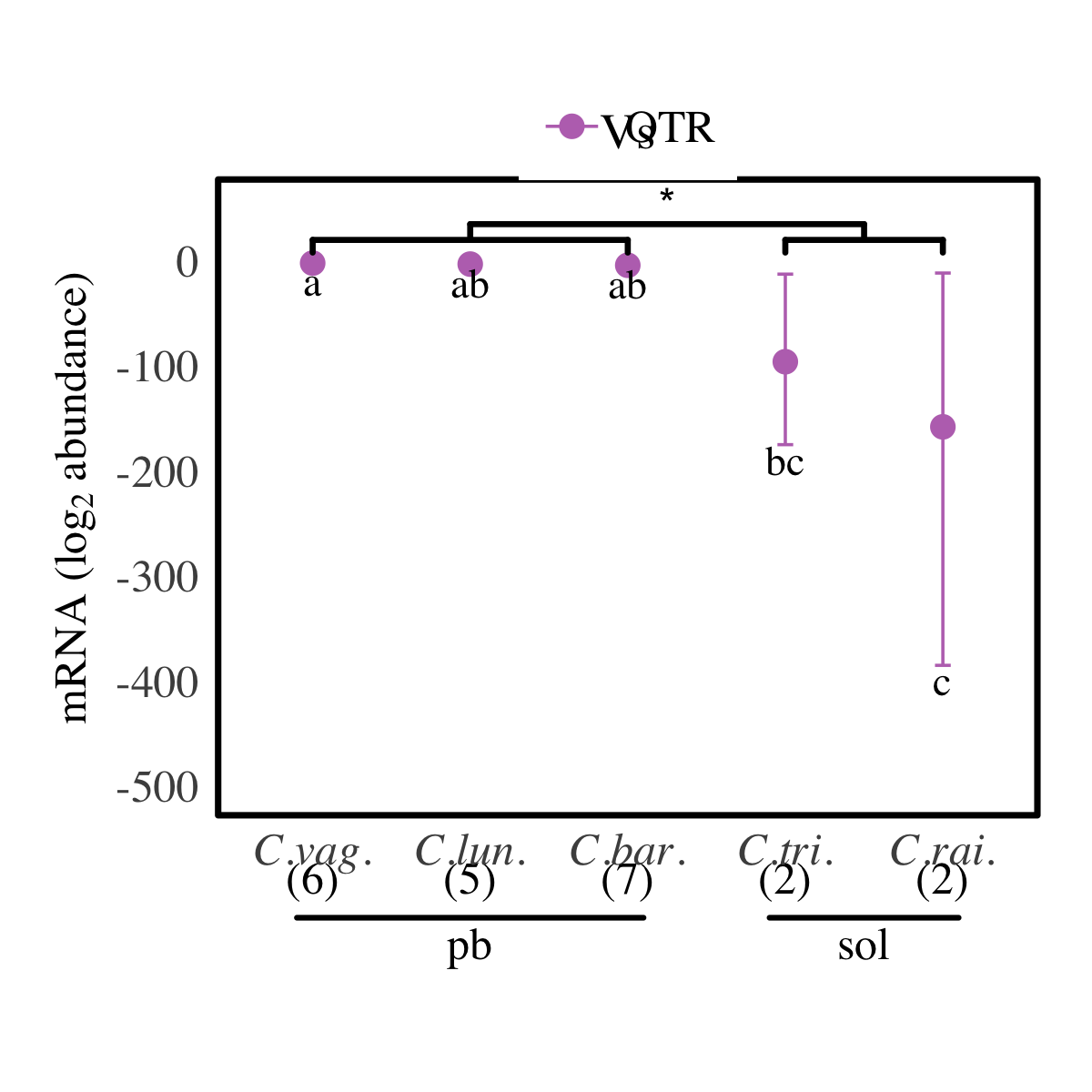


Figure 3.1: Reproduction of figure 2b from Nowicki et al. 2020.

# 4 References

Nowicki, J.P., Pratchett, M.S., Walker, S.P.W., Coker, D.J., O’Connell, L.A., 2020. Gene expression correlates of social evolution in coral reef butterflyfishes. Proceedings of the Royal Society B: Biological Sciences 287, 20200239. <https://doi.org/10.1098/rspb.2020.0239>

### 4.0.1 Colophon

This report was generated on 2021-12-10 15:17:44 using the following computational environment and dependencies:

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#> version R version 4.1.1 (2021-08-10)  
#> os macOS Big Sur 10.16  
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The current Git commit details are:

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#> Remote: main @ origin (https://github.com/Tatianabellagio/buttRflyfish)  
#> Head: [5c19e39] 2021-12-10: work on the paper