

1 **Supplementary Appendix 3.** Boreal ground-beetle (Coleoptera: Carabidae) assemblages of  
2 mainland and islands in Lac la Ronge, Saskatchewan, Canada: supplementary methods and  
3 figure.

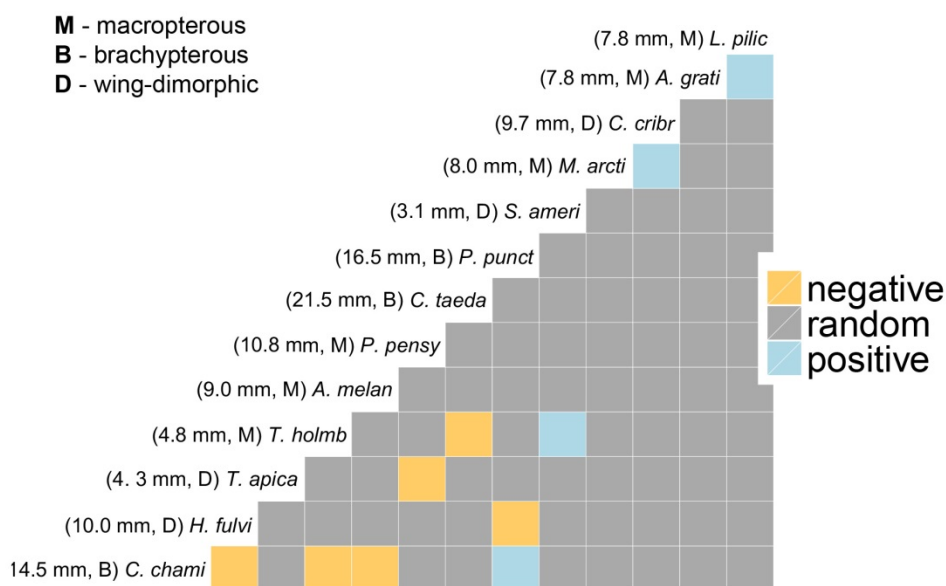
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#### 4 **Co-occurrence analysis**

5 In an effort to understand interactions between carabids on the islands, we also analysed  
6 pairwise associations between species using the ‘cooccur’ package in R (Veech 2013; Griffith *et*  
7 *al.* 2016). This approach calculates the probability that two species co-occur more or less often  
8 than would be expected through random chance (Veech 2013; Griffith *et al.* 2016). Co-  
9 occurrence frequencies of species that were considered significant ( $\alpha = 0.05$ ) were then classified  
10 as ‘negative’ or ‘positively’ co-occurring, or occurring at random.

11 Of the 741 species pairs in the co-occurrence analysis, 268 pairs were analysed because  
12 their expected co-occurrence frequency was  $> 1$  (Veech 2013). Of the 268 testable pairs, only six  
13 and four pair associations were considered significantly ‘negative’ and ‘positive’, respectively  
14 (Supplementary Fig. 1). Interestingly, five of the six ‘negative’ pairs included large-bodied ( $> 14$   
15 mm), brachypterous species and correspondingly smaller-bodied species ( $\leq 10.0$  mm),  
16 suggesting that occurrence on the islands is influenced by subtle interactions between carabid  
17 species.

## Species Co-occurrence Matrix



18

19 **Supplementary Figure 1.** Results of a pairwise co-occurrence analysis illustrating non-random  
 20 species pairs of carabid beetles on the islands of Lac la Ronge, Saskatchewan, Canada.  
 21 Abbreviations of beetle species are as follows: C. chami: *Carabus chamissonis*, H. fulvi:  
 22 *Harpalus fulvilabris*, T. apica: *Trechus apicalis*, T. holmb: *Trachypachus holmbergi*, A. melan:  
 23 *Agonum melanarium*, P. pensy, *Pterostichus pensylvanicus*, C. taeda: *Carabus taedatus*, P.  
 24 punct: *Pterostichus punctatissimus*, S. ameri: *Syntomus americanus*, M. arcti: *Miscodera arctica*,  
 25 C. cribr: *Cymindis cribricollis*, A. grati: *Agonum gratiosum*, L. pilic: *Loricera pilicornis*.  
 26 Average body length based on Lindroth (1969) and Bousquet (2010) and wing type is also  
 27 provided.

- 29 Bousquet, Y. 2010. Illustrated identification guide to adults and larvae of northeastern North  
30 American Ground Beetles (Coleoptera: Carabidae). Pensoft Series Faunistica, 90. Pensoft  
31 Publishers, Sofia, Bulgaria.
- 32 Lindroth, C.H. 1969. The ground-beetles of Canada and Alaska. *Opuscula Entomologica*  
33 Supplement, **20, 24, 26, 29, 33, 34, 35**: 1-1192.
- 34 Griffith, D.M., Veech, J.A., and Marsh, C.J. 2016. Co-occur: probabilistic species co-occurrence  
35 analysis in R. *Journal of Statistical Software*, **69**: 1–17.
- 36 Veech, J.A. 2013. A probabilistic model for analysing species co-occurrence. *Global Ecology*  
37 *and Biogeography*, **18**: 572–592.