The *expected* dissimilarity of communitites of equal richness

Cape vs SWA publication

Ruan van Mazijk

2018-11-04

Define the expected Jaccard similarity coefficient for two communities of richness m, drawn from a species pool of richness n

```
exp_jacc_sim <- function(n, m) {
  j <- 0:(m - 1)
  ans <-
    (1 / choose(n, m)) *
    sum(
      ((m - j) / (m + j)) *
      choose(m, m - j) *
      choose(n - m, j)
    )
}
```

Calculate $E(J(A, B))$ for ranges of n and m

```
data <- expand.grid(n = 1:100, m = 1:100)
data$exp_jacc_dist <- NA
for (i in 1:nrow(data)) {
  data$exp_jacc_dist[[i]] <- 1 - exp_jacc_sim(data$n[[i]], data$m[[i]])
}
```

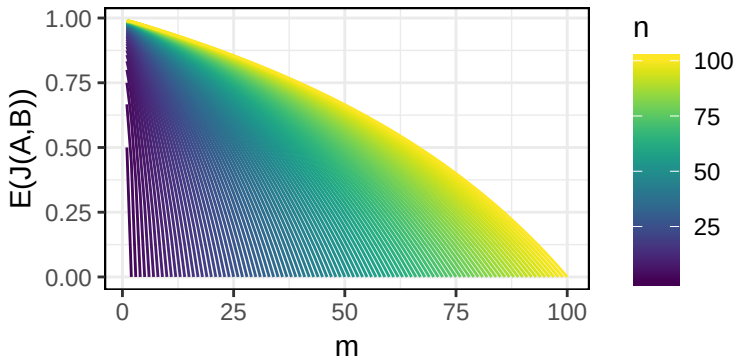

Figure 1: Plot of $E(J(A, B))$ as a function of m (without the $\pm\infty$s and NAs)