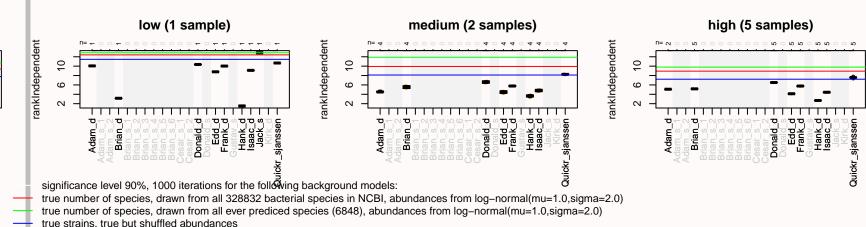
across all 3 datasets

Toy competition, metric: Unifrac

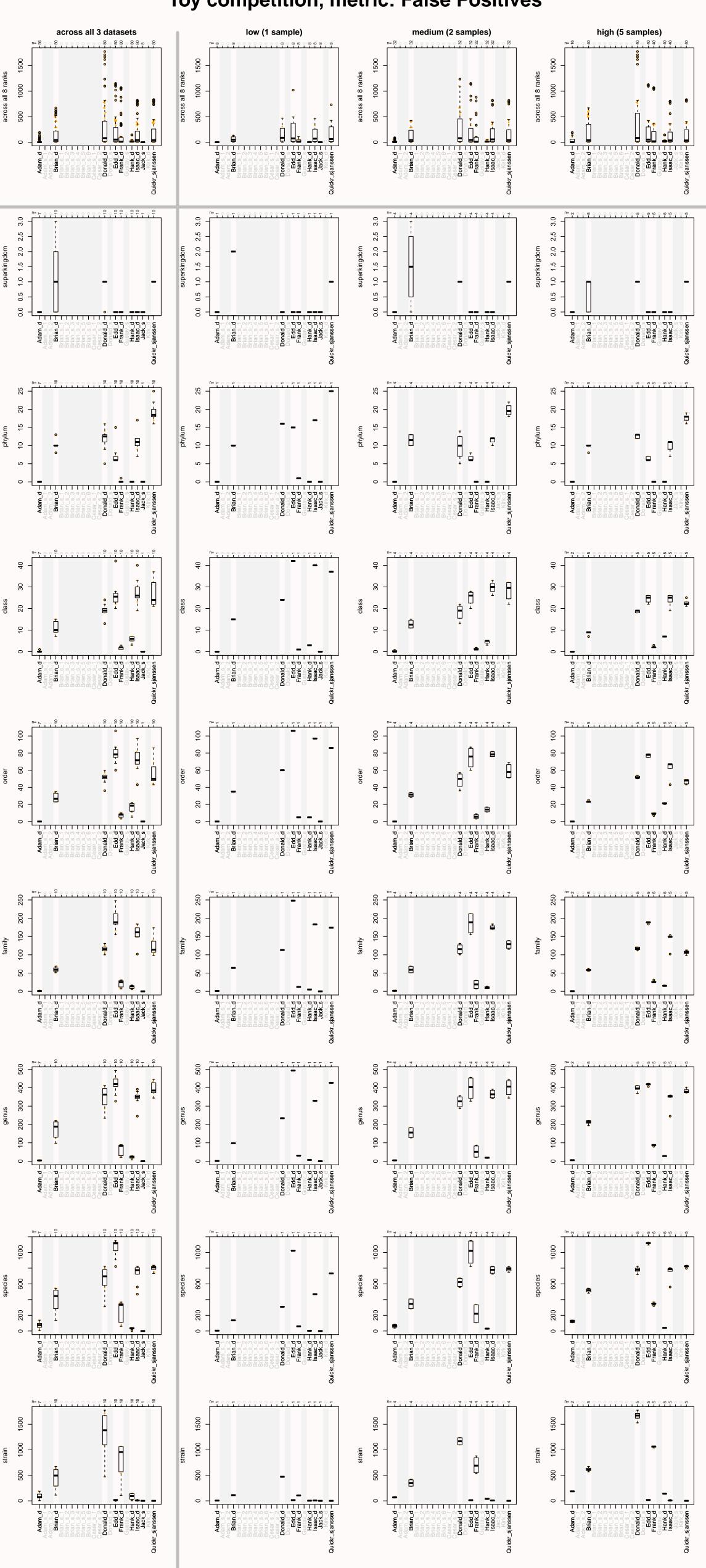


Toy competition, metric: L1norm across all 3 datasets low (1 sample) medium (2 samples) high (5 samples) 1.5 across all 8 ranks across all 8 ranks across all 8 ranks across all 8 ranks 1.0 1.0 1.0 0.5 0.5 Ponald d | Donald d | Donald S | Donald d Donald d Frank d Frank d Hank d Saac d Jack s Adam_d — Brian_d -9 9 9 9 9 9 9 N= 4 0 4 0 0 0 0 0 0 4 0 4 0 4 4 0 0 4 0.5 0.5 0.5 0.5 0.4 0.4 0.4 4.0 superkingdom superkingdom superkingdom superkingdom 0.3 0.3 0.3 0.2 0.2 0.2 0.1 0.1 0.1 0.1 0.0 0.0 Hank d I Hank d Donald_d -Donald_d -Donald_d -Frank_d Hank d Frank Hank Isaac_d Brian_d Brian_d Brian Brian phylum phylum phylum phylum 1.0 1.0 1.0 1.0 • <u>÷</u> Donald d Edd d l Donald_d Frank_d Frank d Edd_d Frank_d Adam_d Donald_d Brian_d Adam_d Brian_d Donald_d Brian_d Brian_d 1.5 1.5 1.5 1.5 class class 1.0 1.0 1.0 1.0 В Brian_d -Onato Edd d-Frank d Frank_d Adam_d Edd_d Frank_d Frank_d Brian_d Donald Donald Brian Donald 1.5 order 1.0 1.0 Brian d Donald_d Frank_d Donald_d 1.5 1.5 1.5 family 1.0 1.0 1.0 1.0 Frank d - Hank d - Hank d - Lasac d Hank_d -Donald_d Donald_d Donald_d 1.5 genus 1.0 1.0 1.0 1.0 Donald d - Edd d - Frank d -Donald d | Land d | L Donald d - Consider Standard - Frank d - Frank Brian_d Brian_d Brian_d 1.5 1.5 species species 1.0 1.0 0.1 ₿ 0.5 0.5 Donald_d -Donald_d -Frank dd. d Frank Brian_d Donald_d 1.2 1.2 1.2 1.2 Brian d Frank d Edd_d Frank_d Brian d Edd_d Frank_d Adam_d Brian_d Brian_d Adam significance level 90%, 1000 iterations for the following background models: true number of species, drawn from all 328832 bacterial species in NCBI, abundances from log-normal(mu=1.0,sigma=2.0) true number of species, drawn from all ever prediced species (6848), abundances from log-normal(mu=1.0,sigma=2.0) true strains, true but shuffled abundances

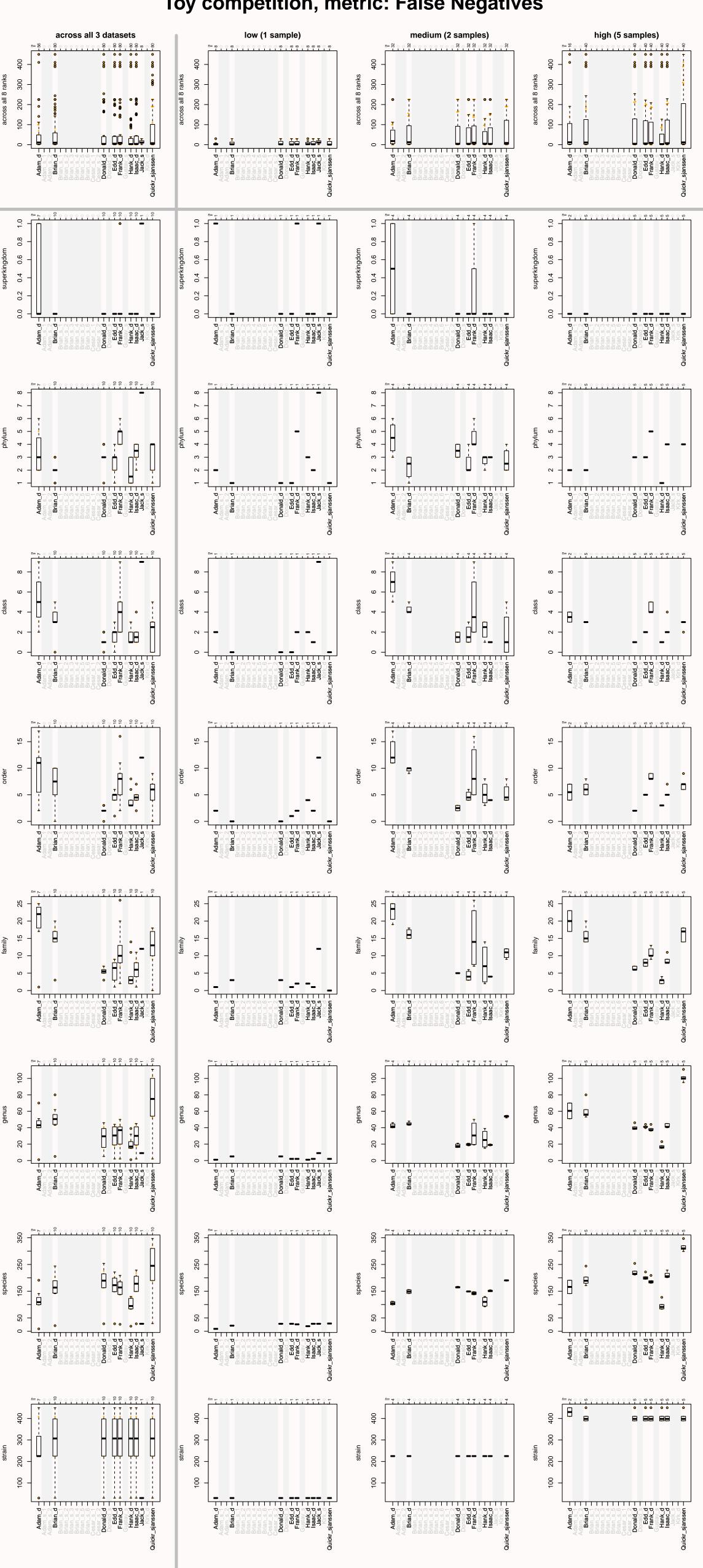
Toy competition, metric: Sensitivity low (1 sample) medium (2 samples) across all 3 datasets high (5 samples) 0.8 0.8 0.8 0.8 across all 8 ranks across all 8 ranks across all 8 ranks across all 8 ranks 9.0 9.0 0.4 0.4 0.4 0.2 0.2 0.2 Prank d Ponald d Donald d Edd d Frank d Hank d Isaac s Jack s Frank d | L Donald 0.9 6.0 0.9 0.9 superkingdom superkingdom superkingdom superkingdom 0.8 0.8 0.8 0.7 0.7 0.7 0.7 9.0 9.0 9.0 0.5 0.5 Frank_d Donald_d Donald_d Brian Brian Brian Brian Donald \blacksquare 9.0 9.0 9.0 9.0 phylum phylum phylum phylum 9.0 0.4 9.7 0.4 Donald_d Edd_d Frank_d Donald d Edd d Frank d Hank d Isaac d Jack s Frank d Frank_d Donald_d Donald_d 0.8 9.0 9.0 9.0 9.0 class class 0.4 0.4 0.4 Adam_d -Edd d Frank d Brian d Adam_d . Edd_d Frank_d Donald_d Donald Brian order 9.0 0.4 Frank_d Frank Brian_d — Brian_d -Donald_d -Hank_d |saac_d-Jack_s -Donald_d -Hank_d -Isaac_d -Frank_d Brian d 9.0 family family 9.0 9.0 9.0 9.4 0.4 9.4 Donald d Edd d Frank d Hank d Isaac d Jack s Frank d Hank d H Donald d | Edd d | Frank d | Hank d | Isaac d | Donald_d -Frank d Brian d Donald_d Quickr_sjanssen 9.0 genus 0.4 Donald d - Donald d - Crark d Fank d Adam_d dam_s_1 dam_s_2 Brian_d Adam_d — dam_s — dam_s 2 — Brian_d — Adam_d d dam_s 1 dam_s 2 dam_s 2 dam_s 2 dam_s 2 dam_s 2 dam_d dam_s 2 dam_d d Quickr_sjanssen ₽ 0.7 0.5 0.5 species species species Donald d | Edd d | Frank d | Donald d Frank_d | Frank Donald_d -Brian d Brian_d -0.5 -0.5 -1.0 -1.0 -1.0 -1.0 Donald d Donald d Donald d Edd d Frank d Hank d Isaac d Jack s Auck s Brian_d -Frank d - Hank d - Isaac d Adam_d -Donald_d -Donald_d

Toy competition, metric: Precision across all 3 datasets low (1 sample) medium (2 samples) high (5 samples) 0.8 0.8 0.8 0.8 across all 8 ranks across all 8 ranks across all 8 ranks across all 8 ranks 9.0 9.0 0.4 0.4 0.2 0.2 0.2 0.2 Ì Prank d Donald d - Donald S - Adam_d _ 0.8 0.8 0.8 superkingdom superkingdom superkingdom 0.8 superkingdom 0.6 0.7 0.7 0.7 0.7 9.0 9.0 9.0 0.5 0.5 0.5 0.4 Frank_d Brian d Frank Frank d Brian_d Donald d Donald_d Donald_d Brian Brian 0.8 0.8 0.8 0.8 phylum phylum phylum phylum 9.0 0.4 Donald d Donald S Edd d Frank d Frank_d Donald_d Frank_d Donald_d Frank Donald_d 0.8 class ₫ 9.0 Ē 0.4 0.4 0.4 0.4 Hank_d --Isaac_d --Jack_s --Adam_d -Brian_d Frank Edd_d Frank_d Donald_d Brian Brian Donald Adam Brian 9.0 9.0 order Ţ 0.4 9.0 0.4 0.2 0.2 Frank d Frank_d Brian_d — Brian_d -Frank Frank Frank Hank d - Isaac_d - Isaac_d -Donald_d -Donald_d -Frank d Brian d -Donald_d j family family Ď 0.4 0.4 0.4 Donald & Don Donald de la Frank de la Lank de Frank d Frank d Hank d H Brian d Brian d Brian d Brian d Adam_d 0.8 genus genus 0.4 0.4 0.2 ₿ 0.0 Donald d - Carlo and a carlo a Adam_d -Ponald d Donald d Donald d Frank d Frank d Hank d Saac d Jack s Adam_d dam_s_l dam_s_l Brian_d Brian_d -Brian_d -Adam_d dam_s_d dam_s_l Brian_d 0.8 9.0 9.0 9.0 species species 0.4 0.4 Donald d + The Bonald S + The Bonald 0.2 0.2 0.2 Donald S Donald C — Edd C — Frank C — Hark C — Isaac C — Frank_d Brian d Donald_d Brian_d -Brian Adam_d Brian d -0.5 -0.5 -0.5 -1.0 -1.0 -1.0 -1.0 Donald d Donald d Donald d Edd d Frank d Hank d Saac d Edd_d Edd_d Frank_d Hank_d Isaac_d Brian_d -Adam_d -Donald_d -

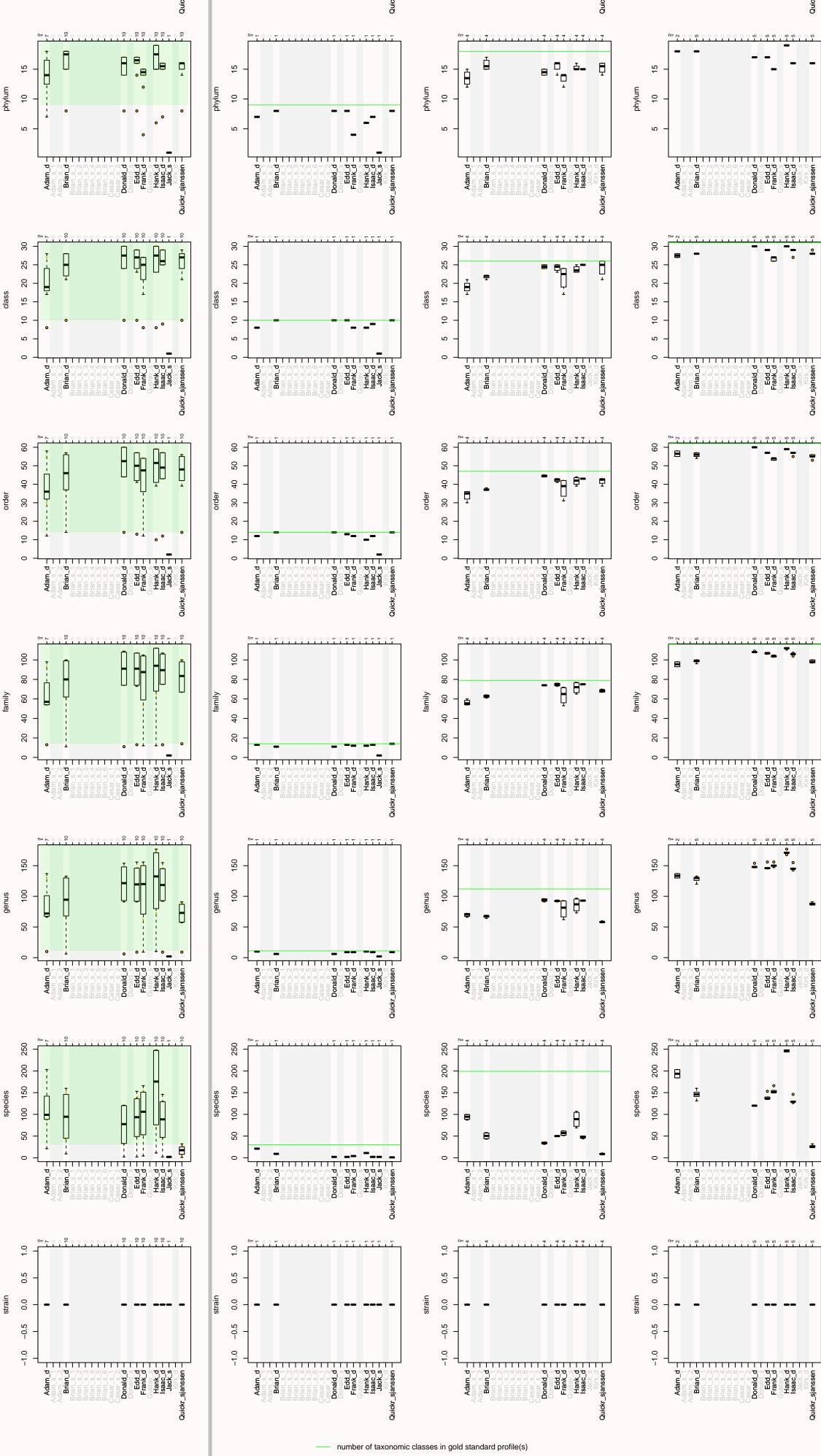
Toy competition, metric: False Positives



Toy competition, metric: False Negatives



Toy competition, metric: True Positives medium (2 samples) across all 3 datasets low (1 sample) high (5 samples) 250 250 200 200 200 across all 8 ranks across all 8 ranks across all 8 ranks 150 150 150 100 100 100 20 20 Donald d – Edd d – Frank d – Frank_d -Hank d Frank Hank Isaac Jack 6. 6. 6. superkingdom superkingdom superkingdom 1.6 1.6 1.6 4. 4. 1.2 1.2 1.0 Frank_d Fard Add D Frank_d Brian_d Donald_d Brian_d Donald_d Donald d Brian Brian 15 15 phylum phylum phylum 10 10 10 2 2 2 Donald_d Frank d Frank d Frank_d Donald_d Donald_d 30 ļ 25 25 25 20 20 20 class 15 15 15 10 10 10 Frank Adam_d Edd_d Frank_d Edd_d Frank_d Donald_d Donald Brian 9 9 ļ 20 20 20 40 40 40 order order 30 30 30 20 20 20 10 10 10 Brian_d — Donald_d -Brian_d -Hank_d -Isaac_d -Brian d Frank Donald_d . Frank_d Donald_d Adam_d Quickr_sjanssen 100 100 100 80 80 80 family family 9 9 9 40 40 40 20 20 20 Tank Saac d Saac d LIIII Donald d L Frank d Hank d H Donald_d -Frank d Brian d Brian d Quickr_sjanssen Adam_d Quickr_sjanssen 150 150 150 100 100 100 genus genus **—** 20 20 20 Donald d - Donald d - Donald d - Edd_d - Frank_d - Hank_d - Base_d Ponald d | Edd_d | Frank_d | Hank_d | Isaac_d Adam_d ddam_s_1 ddam_s_2 Brian_d Brian_d -Ponald d | Donald d | Quickr_sjanssen -250 200 200 200 150 150 150 species species species 100 100 100 50 20 50 Donald d Don Brian_d — Donald_d -Frank_d Donald_d -Frank_d Adam_d Brian_d Brian_d



200

150

2.

1.6

1.2

superkingdom

Adam_d _

across all 8 ranks