

Additional materials for the article

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## SCRIPT OF LOAD TEST MODEL THAT WE USED TO OBTAIN ALMOST LINEAR ACCELERATION IN THE MPI CONSOLE VERSION

```
DECLARE
volume = 1
nonspec = 1
spec = 7
flow = 0.01
substrates_ns = 1e-4
substrates_ss = 1e-4, 1e-4, 1e-4, 1e-4, 1e-4, 1e-4, 1e-4
comsub = 1e-3

// параметр угла наклона (степень "хилловости")
//PENALTY_N = 2
// параметр начала возрастания
//PENALTY_K = 11
// максимальный коэффициент штрафа (от 0 до 1)
PENALTY_MAX_LEVEL = 0.15
// начиная с какого числа генов штраф будет максимальным
PENALTY_MAX_GENES = 20

BETA_MEAN_SS = 0.5
BETA_DISP_SS = 0.2

BETA_MEAN_SP = 0.5
BETA_DISP_SP = 0.2

POP=1
  size=1e+6
  increaser=rubel_p
  k_death=1e-11
  k_flow=0.01
  cprod=1e+6
  ccons_nsp=5e+7
  ccons_sp=100000.0
  gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
  gene_s=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
  gene_p=2;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(1)

POP=2
  size=1e+6
  increaser=rubel_p
  k_death=1e-11
  k_flow=0.01
  cprod=1e+6
  ccons_nsp=5e+7
  ccons_sp=100000.0
  gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
  gene_s=2;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
  gene_p=3;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(2)

POP=3
  size=1e+6
  increaser=rubel_p
  k_death=1e-11
  k_flow=0.01
  cprod=1e+6
  ccons_nsp=5e+7
  ccons_sp=100000.0
  gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
  gene_s=3;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
  gene_p=4;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(3)

POP=4
  size=1e+6
  increaser=rubel_p
  k_death=1e-11
  k_flow=0.01
```

```

cprod=1e+6
ccons_nsp=5e+7
ccons_sp=100000.0
gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=4;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=5;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(4)

POP=5
size=1e+6
increaser=rubel_p
k_death=1e-11
k_flow=0.01
cprod=1e+6
ccons_nsp=5e+7
ccons_sp=100000.0
gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=5;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=6;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(5)

POP=6
size=1e+6
increaser=rubel_p
k_death=1e-11
k_flow=0.01
cprod=1e+6
ccons_nsp=5e+7
ccons_sp=100000.0
gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=6;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=7;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(6)

POP=7
size=1e+6
increaser=rubel_p
k_death=1e-11
k_flow=0.01
cprod=1e+6
ccons_nsp=5e+7
ccons_sp=100000.0
gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=7;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(7)

POP=8
size=1e+16
increaser=rubel_p
k_death=1e-11
k_flow=0.01
cprod=1e+6
ccons_nsp=5e+7
ccons_sp=100000.0
gene_n=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=2;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=3;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=4;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=6;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=5;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_s=7;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=1;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=2;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=3;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=4;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=5;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=6;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
gene_p=7;allele_values: 3,4,5,6,7,8,9,10,11,12; allele_concentrations: 1,1,1,1,1,1,1,1,1,1
END POP(8)
END DECLARE

iterate=100
//hgt = acceptor:1; donor:3; gene_type:s; sub_num:3; p_size:3e+7;
//iterate=1000
//set_ns=0
//iterate=2000
//set_ns=5e-4
//iterate=1000

```