

Tables & Figures

Table 1. Number and type of parent-offspring triplets

	Dent	Flint	Introgression	Total
F ₂	38	68	29	136
BC _{1/2}	12	0	16	27
Total	50	68	45	163

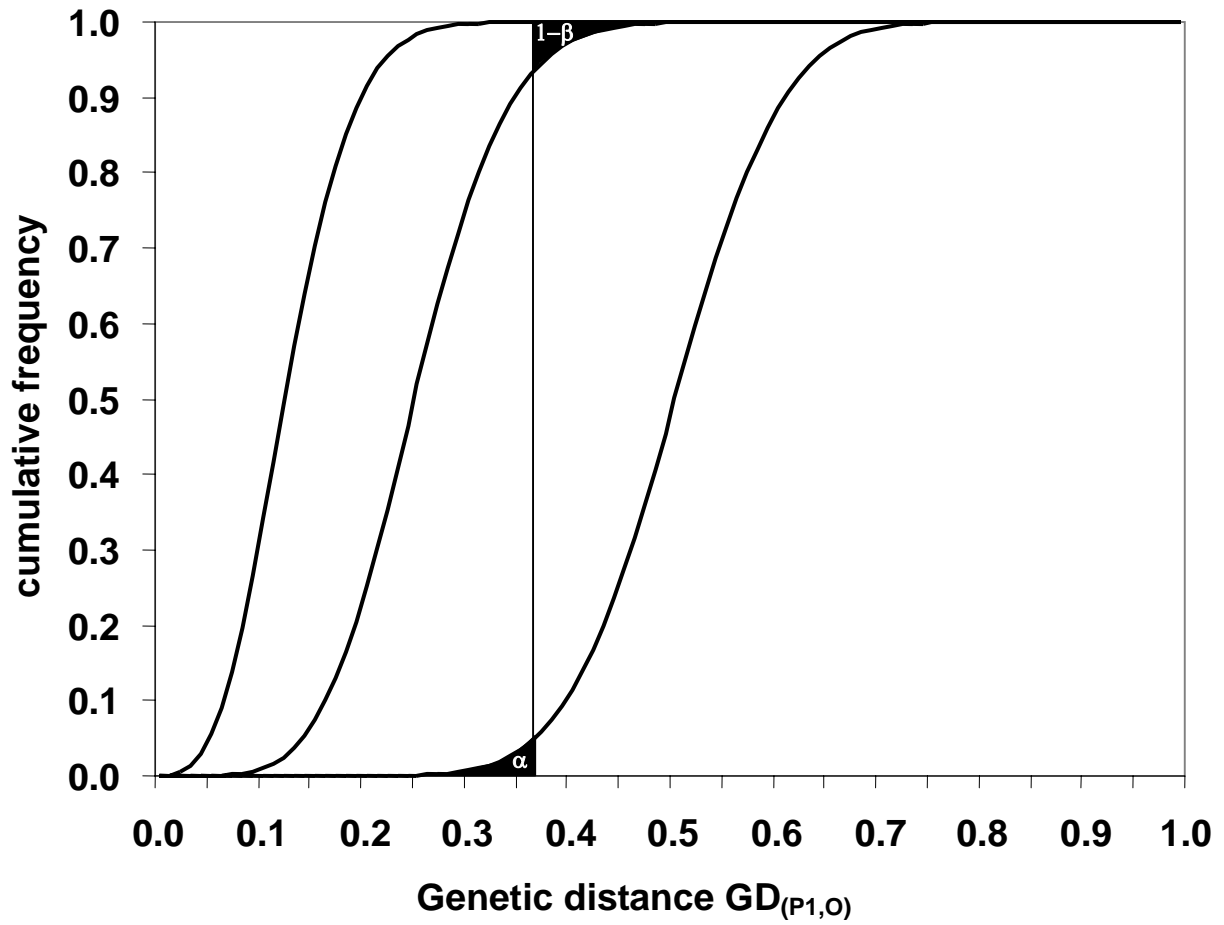


Figure 1. Cumulative frequency distributions of $GD_{(P1,O)}$ for F_2 -, BC_1 -, and BC_2 -derived progenies based on simulated data assuming $GD_{(P1,P2)}=0.00$ Type I (α) and Type II ($1-\beta$) errors refer to $T=0.37$ for discriminating F_2 vs. BC_1 -derived progeny lines.

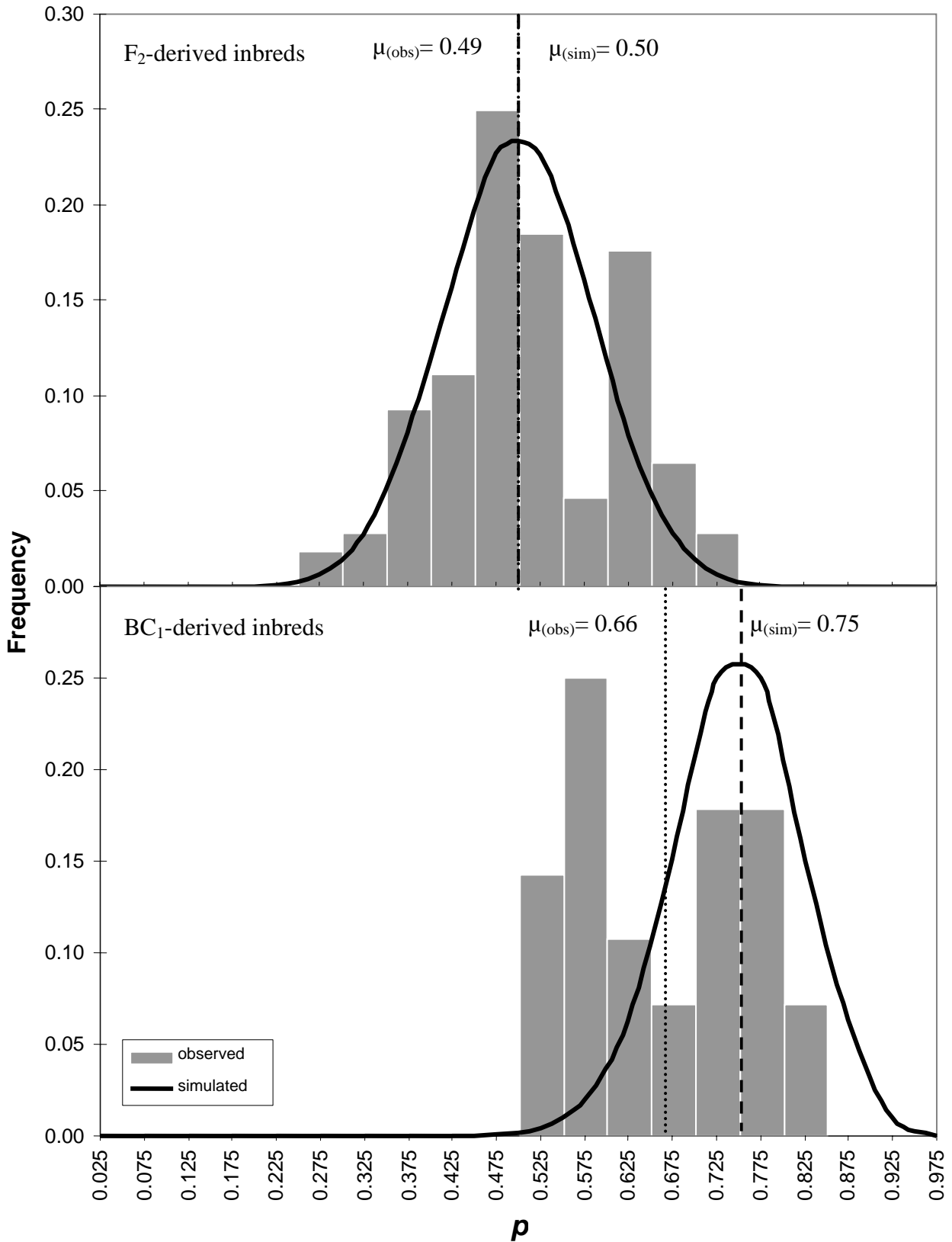


Figure 2. Histograms of observed (columns) and simulated (curve) parental contributions (p) for F₂- and BC₁-derived progeny lines. Observed ($\mu_{(obs)}$) and simulated ($\mu_{(sim)}$) means are indicated by dotted and dashed lines, respectively.

Table 2. Comparison of observed and simulated or calculated parameters for the statistical concept used in this study.

Parameter	F ₂		BC ₁	
	observed	simulated	observed	simulated
μ_p	0.4893	0.5000	0.6567	0.7500
σ_p^2	0.0107	0.0102	0.0088	0.0076
$\mu_{GD(P1,P2)}$	0.6314		0.7277	
$\sigma_{GD(P1,P2)}^2$	0.0024		0.0034	
$\hat{\mu}_{GD(P1,O)}$	0.3095	0.3157 [†]	0.2465	0.1819 [†]
$\sigma_{GD(P1,O)}^2$	0.0051	0.0063 [‡]	0.0034	0.0043 [‡]

[†] Calculated with Eq. [1] on the basis of observed $\mu_{GD(P1,P2)}$ and $\sigma_{GD(P1,P2)}^2$ and simulated μ_p and σ_p^2

[‡] Calculated with Eq. [4] on the basis of observed $\mu_{GD(P1,P2)}$ and $\sigma_{GD(P1,P2)}^2$ and simulated μ_p and σ_p^2

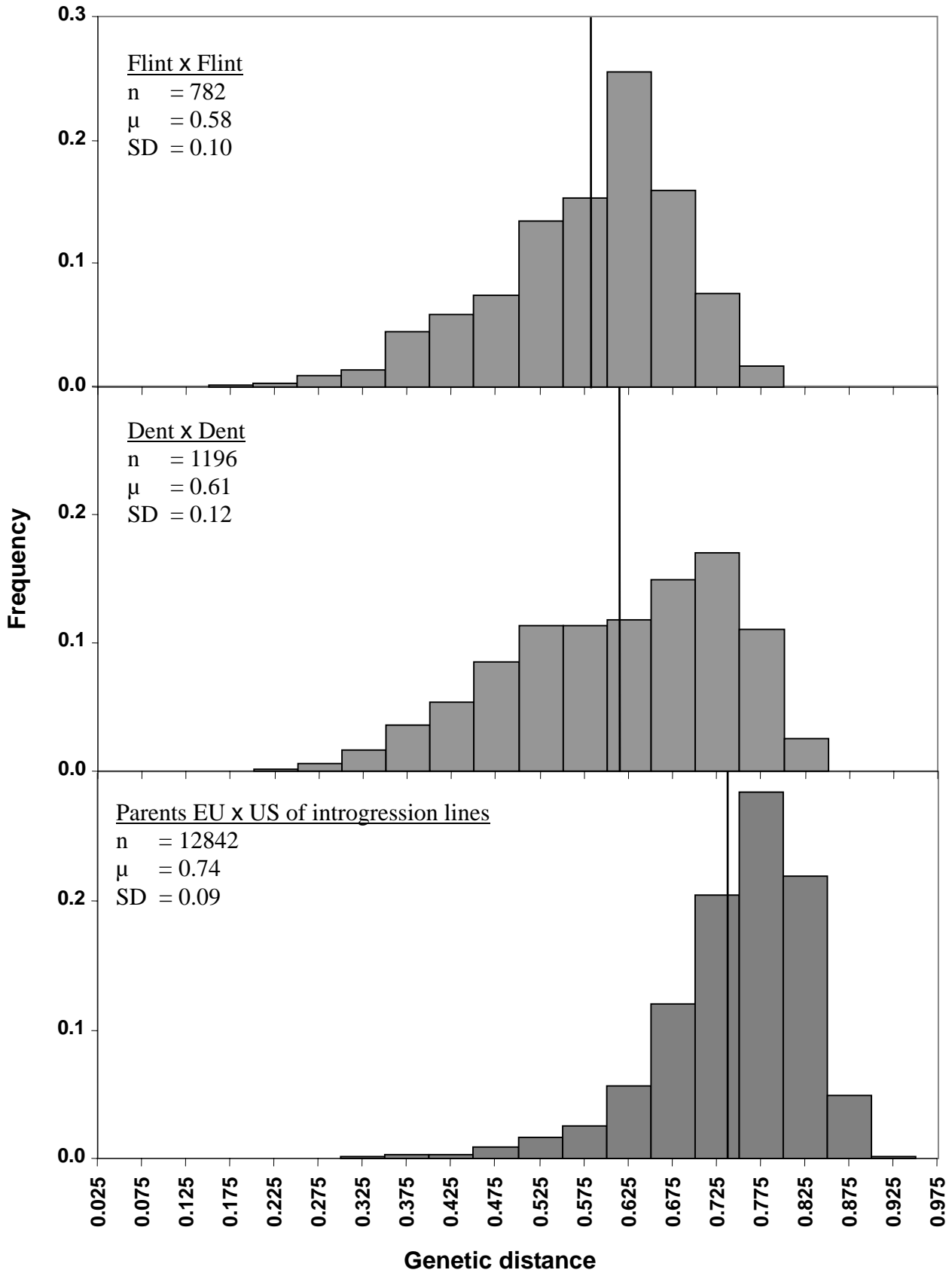


Figure 3. Histograms of Rogers' genetic distances calculated from SSR data between unrelated ($f=0$) lines from European Flint and Dent and parents of introgression lines. Means are indicated by solid lines.

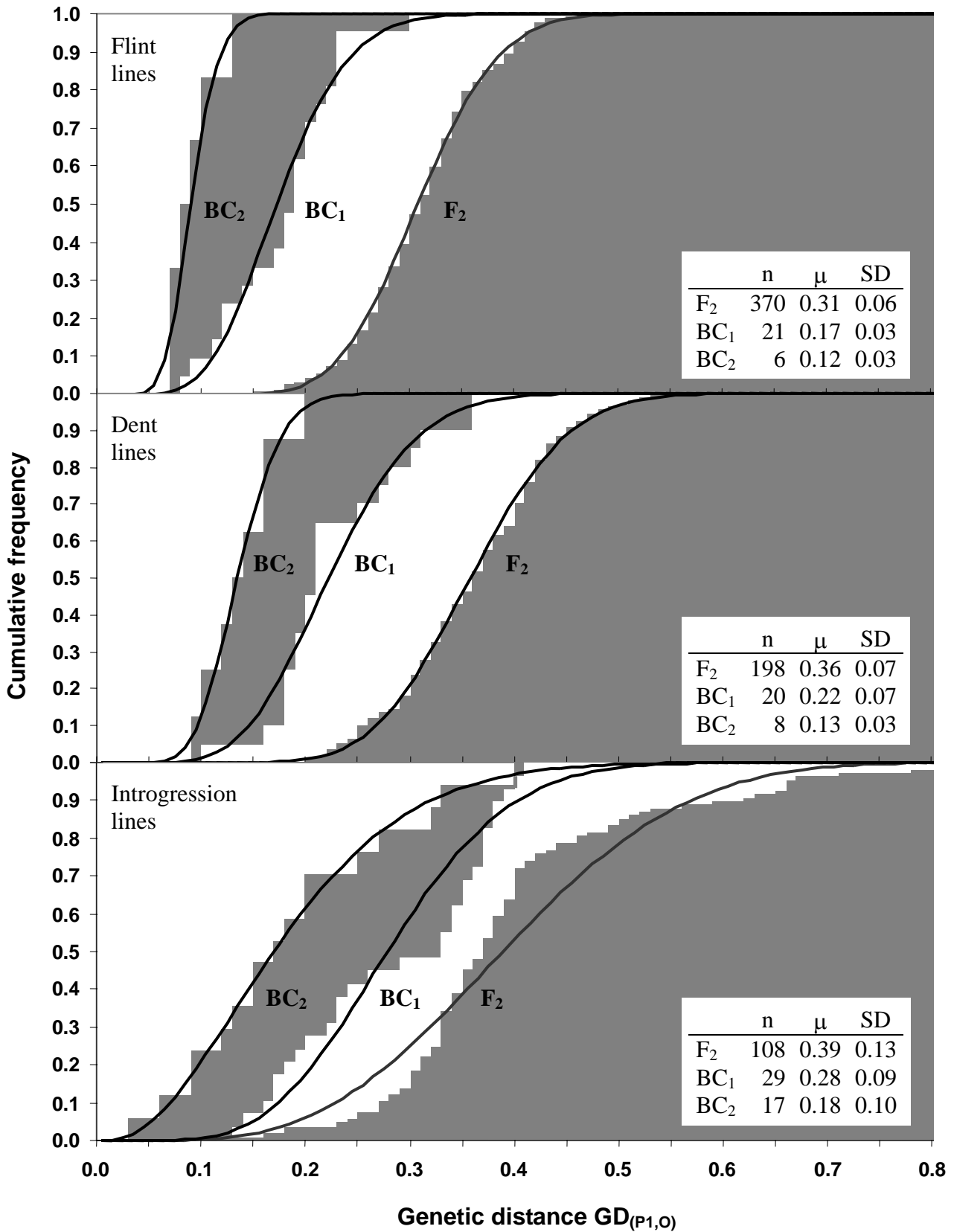


Figure 4. Cumulative histograms (columns) and approximated beta distributions (curves) for genetic distances based on 100 SSRs for F_2 -, BC_1 -, and BC_2 -derived progenies. Variables n, μ , and SD refer to the number of values, the arithmetic mean, and the standard deviation of GD values for the particular distribution, respectively.

Table 3. Evaluation of the discriminatory power of different EDV thresholds (T) based on observed and simulated data. \overline{SE} refers to the average standard error of observed GDs, which were equal to the particular threshold.

Scenario	Flint lines		Dent lines		Introgression lines	
	observed	simulated	observed	simulated	observed	simulated
-----(F₂ vs. BC₁)-----						
$\alpha=0.05$						
$T_{0.05}$	0.21	0.17	0.24	0.18	0.19	0.24
$(1-\beta_T)$	0.77	0.72	0.63	0.71	0.15	0.85
\overline{SE}	0.041	0.036	0.041	0.039	0.039	0.041
$\alpha=\beta$						
$T_{\alpha=\beta}$	0.24	0.20	0.28	0.22	0.32	0.26
$\alpha=\beta$	0.12	0.12	0.17	0.14	0.32	0.10
\overline{SE}	0.041	0.039	0.045	0.042	0.047	0.043
T=0.25 (ASTA)						
α	0.18	0.30	0.07	0.26	0.15	0.07
$(1-\beta_T)$	0.92	0.98	0.68	0.95	0.40	0.90
\overline{SE}	0.043	0.043	0.043	0.043	0.043	0.043
T=0.20 (ASSINSEL)						
α	0.03	0.11	0.01	0.09	0.07	0.02
$(1-\beta_T)$	0.72	0.87	0.39	0.81	0.19	0.70
\overline{SE}	0.039	0.039	0.039	0.039	0.039	0.039
T=0.15 (SEPROMA-orange)						
α	0.00	0.02	0.00	0.02	0.01	0.02
$(1-\beta_T)$	0.36	0.59	0.13	0.53	0.07	0.06
\overline{SE}	0.034	0.034	0.034	0.034	0.034	0.034
-----(BC₁ vs. BC₂)-----						
$\alpha=0.05$						
$T_{0.05}$	0.09	0.07	0.12	0.07	0.15	0.08
$(1-\beta_T)$	0.60	0.55	0.40	0.50	0.29	0.54
\overline{SE}	0.027	0.024	0.030	0.027	0.034	0.027
$\alpha=\beta$						
$T_{\alpha=\beta}$	0.11	0.10	0.16	0.10	0.24	0.12
$\alpha=\beta$	0.11	0.20	0.18	0.18	0.35	0.18
\overline{SE}	0.031	0.028	0.036	0.028	0.041	0.030
T=0.15 (SEPROMA-orange)						
α	0.37	0.59	0.13	0.53	0.07	0.06
$(1-\beta_T)$	0.99	0.98	0.72	0.97	0.47	0.44
\overline{SE}	0.034	0.034	0.034	0.034	0.034	0.034
T=0.10 (Troyer et al./SEPROMA-red)						
α	0.07	0.00	0.02	0.00	0.01	0.10
$(1-\beta_T)$	0.75	0.20	0.16	0.18	0.10	0.72
\overline{SE}	0.028	0.028	0.028	0.028	0.028	0.028