



W051: Estimates of Numbers of Diagnostic Markers Required to Identify Introgressions in Diploid Cross-Species Hybrids from Different Types of Inter and Backcross Populations

Saturday, January 12, 2019

04:05 PM - 04:25 PM

📍 *Royal Palm Salon 3-4*

The use of artificial cross-species hybridizations to generate animals and plants better suited for draft and food production has been important in agriculture for centuries, and is still widely used with increasing importance especially in aquaculture. Adequate analytic tools for correct identification of cross-species hybrids from intercrossed and backcrossed populations, based on marker panels with adequate numbers of independent markers, are increasingly necessary for accurate species-purity certification and management of commercial broodstocks, in addition to monitoring of wild populations, especially when resulting hybrids are fully fertile. A statistical framework was developed based on power analysis to estimate minimal numbers of di-allelic markers with species-specific alleles required to reliably identify hybrids in advanced intercrossed and backcrossed populations. Simulated populations were used to test accuracy of proposed estimates. Estimated numbers of required markers ranged from 5 to 191 ($\alpha=0.05$), and from 7 to 293 ($\alpha=0.01$), considering backcross 1 (BC1) to BC6 populations, respectively. Numbers of markers required for proper hybrid identification observed in simulated BC1 to BC6 populations ranged from 5 to 1,131 and 7 to 8,065, considering error rates $\leq 5\%$ and $\leq 1\%$, respectively. Obtained results indicate that cost-effective assay panels could be developed to provide practical tools for use in commercial and research settings, for proper hybrid identification following even up to four generations of backcrossing (BC4).

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