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# Comparison of Eggshell Porosity and Estimated Gas Flux Between the Brown-Headed Cowbird (*Molothrus ater*) and its Hosts: the Dickcissel (*Spiza americana*) and the Red-Winged Blackbird (*Agelaius phoeniceus*)

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Poster Presentation P10

# COMPARISON OF EGGSHELL POROSITY AND ESTIMATED GAS FLUX BETWEEN THE BROWN-HEADED COWBIRD (*MOLOTHRUS ATER*) AND ITS HOSTS: THE DICKCISSEL (*SPIZA AMERICANA*) AND THE RED-WINGED BLACKBIRD (*AGELAIUS PHOENICEUS*)

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The Brown-headed Cowbird is a brood parasitic icterid that lays eggs in nests of other species, including the Dickcissel and a non-parasitic icterid, the Red-winged Blackbird. Cowbird eggs reportedly hatch sooner than equivalently-sized host eggs, providing their hatchlings a potential competitive advantage over host offspring. We tested the hypothesis that the apparent accelerated development of cowbird offspring is a result of differences in the physical character of the eggshell and that those differences increase the fluxes of respiratory gasses to and from the developing chick. Cowbird egg size is intermediate between those of the larger Red-winged Blackbird and the smaller Dickcissel, but cowbird eggshell thickness was significantly greater than the eggshells of either potential host ($p < 0.001$). The number of pores per egg was similar between cowbirds and Dickcissels, but the total pore area per egg was significantly greater in cowbirds ($p < 0.001$). Red-winged Blackbird eggs, in contrast, had a greater number of pores than cowbird eggs ($p < 0.001$), but cowbird egg pore area was 1.9x larger ($p = 0.016$). Estimates of eggshell conductance ($G_{H20}$) revealed that cowbird eggs were more conductive than Dickcissel eggs ($p < 0.001$), but not different than the eggs of Red-winged Blackbirds ($p = 0.064$). When conductance was normalized to published values of egg weight, cowbird eggs had a higher weight-specific conductance than Dickcissel ($p < 0.001$) or Red-winged Blackbird eggs ($p = 0.004$). Differences in eggshell characteristics predicatively influence gas fluxes across the eggshell and potentially explain variation in incubation periods among species.