



## National Quail Symposium Proceedings

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Volume 7

Article 69

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2012

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#### Recommended Citation

Gerhold, Richard W.; McDougald, Larry R.; and Beckstead, Robert B. (2012) "Construction of Species-Specific PCR Primers for Detection of Coccidia Parasites in Captive-Reared Northern Bobwhites," *National Quail Symposium Proceedings*: Vol. 7 , Article 69.

Available at: <https://trace.tennessee.edu/nqsp/vol7/iss1/69>

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# CONSTRUCTION OF SPECIES-SPECIFIC PCR PRIMERS FOR DETECTION OF COCCIDIA PARASITES IN CAPTIVE-REARED NORTHERN BOBWHITES\*

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## ABSTRACT

Captive rearing and subsequent release of game birds, including northern bobwhites (*Colinus virginianus*), has become common in certain areas. In this practice, bobwhites are often raised in confinement to 'flight ready' and subsequently released for hunting. It is estimated that 30–40 million bobwhites are raised in captivity annually and some farms in the USA produce upwards of 1 million birds annually for this market. Raising game birds in these densities greatly facilitates the transmission of pathogenic organisms. Coccidiosis has been previously identified as an important disease in captive bobwhites and infection can lead to weight loss, diarrhea, poor feather growth, dehydration and, in severe cases, death. *Eimeria lettyae*, *E. colini*, and *E. dispersa* are the three described coccidia species from bobwhites. We investigated the prevalence and distribution of species of coccidia in captive bobwhite facilities throughout the United States. We collected litter or intestinal samples from 31 captive bobwhite facilities originating from 13 states. Species-specific PCR primers were constructed against the internal transcribed spacer region 1 (ITS-1) of the ribosomal RNA gene of the various *Eimeria* spp. to aid in parasite detection and distinction. Primers were used to detect the specific *Eimeria* spp. in the collected samples. All 31 samples were positive for coccidia. Results of the primer survey disclosed *E. lettyae*, *E. dispersa*, and an unidentified *Eimeria* sp. in 20 (64.5%), 22 (72%), and 29 (93.5%) of the samples, respectively. Thirteen (41.9%) samples had 3 *Eimeria* spp. detected, 14 (45.2%) samples had 2 spp. detected, and 4 (12.9%) samples had 1 sp. detected. Flock age or geographical location was not associated with the presence of any particular *Eimeria* spp. To our knowledge, this is the first study of coccidia in captive bobwhites. Previous studies of *Eimeria* spp. in wild northern bobwhite are rare and disclosed variable prevalence rates ranging from 0 to 36%; no efforts were made to distinguish the coccidia species in these studies. It would be helpful to use the species-specific primers constructed in this study to examine the prevalence and distribution of the *Eimeria* spp. in wild bobwhites from throughout their range to investigate the potential for captive-raised bobwhites to be a source of coccidiosis for wild bobwhites.

\* Developed from Gerhold, R. W., L. R. McDougald, and R. B. Beckstead. 2011. Construction of pcr primers to detect and distinguish *Eimeria* spp. in northern bobwhites and a survey of *Eimeria* on gamebird farms in the United States. *Journal of Parasitology* 97: 892–895.

**Citation:** Gerhold, R. W., L. R. McDougald, and R. B. Beckstead. 2012. Construction of species-specific PCR primers for detection of coccidia parasites in captive-reared northern bobwhites. *Proceedings of the National Quail Symposium* 7:107.

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