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Prevalence of Poxvirus in a Population of California Quail from Oregon, 1975–1987

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ABSTRACT: Prevalences of poxvirus in a population of California quail (*Callipepla californica*) at the E. E. Wilson Wildlife Area, Oregon, were determined from 1982 through 1987 and compared with previously published results on prevalences in this population from 1975 to 1979. Poxvirus was present in 19 of 89 quail collected. Prevalences ranged from 6% for immature females to 41% for immature males. Prevalences were lowest during summer and fall and highest in winter and spring. Differences in the seasonal prevalences may be related to the seasonal dispersion pattern of quail.

Key words: Poxvirus, California quail, *Callipepla californica*, field study, prevalence.

Poxvirus in California quail (*Callipepla californica*) was first reported from birds taken at the E. E. Wilson Wildlife Area, Oregon, during the winter of 1975–1976 (Crawford et al., 1979). Studies of this population from 1975 to 1979 (Crawford et al., 1979; Crawford, 1986) revealed that poxvirus occurred in epornitic proportions during this time, prevalences were lowest during summer and early fall, and prevalence was greater among immatures than among adults. The objectives of this study were to determine if poxvirus was present in the population from 1982 to 1987, if prevalences were related to sex and age of quail, and if seasonal differences in prevalences persisted.

From fall 1982 through fall 1987, 89 California quail were collected by shooting at the E. E. Wilson Wildlife Area, 16 km north of Corvallis, Benton County, Oregon (44°50'N, 123°15'W). Sex and age (adult or immature), based upon the appearance of the primary wing coverts (Leopold, 1939), were noted for all birds. Birds ≥ 12 mo of age were classified as adults; immatures ranged from approximately 3 mo to < 12 mo. During summer, all adult-sized birds were classified as adults; no chicks were collected. Poxvirus

was diagnosed by D. H. Helfer, Veterinary Diagnostic Laboratory, Oregon State University (Corvallis, Oregon 97331, USA) from histological examination of lesions from California quail taken in 1976 and 1977, which revealed the presence of Bollinger bodies (see Crawford et al., 1979). During this study, quail with discrete, proliferative processes characterized by swelling and superficial necrotic tissue were considered to be infected by poxvirus and the location of all poxvirus lesions were noted. Lesions of a questionable nature were submitted to S. P. Snyder, Veterinary Diagnostic Laboratory, Oregon State University (Corvallis, Oregon 97331, USA) for examination. Prevalences were based on the frequency of occurrence of poxvirus lesions.

Nineteen of the 89 (21%) quail examined had poxvirus lesions on their toes or tarsi (Table 1). Poxvirus lesions were found on four of 31 adult males (13%), five of 19 adult females (26%), nine of 22 immature males (41%) and one of 17 immature females (6%). Crawford (1986) noted that prevalence of poxvirus lesions was approximately three-fold greater among immature California quail than among adults from 1975 to 1979, but there were no differences between males and females. By contrast, Davidson et al. (1980) and Wilson and Crawford (1988) found prevalences were unrelated to sex and age of northern bobwhites (*Colinus virginianus*) and Wilson and Crawford (1988) noted that prevalence of lesions in scaled quail (*Callipepla squamata*) was not related to sex or age of the birds. Prevalence of poxvirus lesions among immature California quail from 1982 to 1987 (26%) was similar to that reported by Crawford (1986) for quail collected by shooting on the study area from

1975 to 1979 (23%), but prevalence for adults was higher (8% from 1975–1979 and 18% from 1982–1987). Sample sizes were inadequate for use of statistical comparisons of these data, however.

The seasonal pattern identified from 1975 to 1979, low prevalences during summer and fall and high prevalences in winter and spring, also was apparent from 1982 to 1987. From 1982 to 1987, prevalences (Table 1) ranged from 0 to 64%; prevalences were highest during winter and spring (25 to 64%) and lowest during summer and fall (0 to 15%). Prevalences were higher, however, in winter and spring periods from 1982 and 1987 than during those seasons from 1975 to 1979, which resulted primarily from higher infection rates among adults, particularly females. From 1975 to 1987 (Crawford et al., 1979; Crawford, 1986; this study), birds infected with poxvirus were found during two of four summer and three of 12 fall collections, whereas infected quail were observed during all winter (6) and spring (4) seasons that birds were examined. Seasonal prevalences and annual frequencies of occurrence indicated a strong seasonal influence on poxvirus in this population of California quail. Observations indicated that California quail were widely distributed throughout the study area during the breeding season (late spring to early fall) in pairs or family groups. From fall to spring, however, quail occurred in larger groups and made consistent use of relatively small ranges on the study area. Many roost sites used by coveys from fall to spring during 1975 to 1979 were still in use from 1982 through 1987. Habitual use of sites by these coveys may increase the opportunity for exposure by contact with infected individuals.

This follow-up work to studies conducted from 1975 to 1979 revealed that nearly a decade after poxvirus was first noted in high prevalences in this popula-

TABLE 1. Prevalences of poxvirus in California quail collected at E. E. Wilson Wildlife Area, Oregon, 1982–1987.

Season	Number examined	Number infected	Prevalence
Fall 1982	2	0	0
Fall 1983	3	0	0
Fall 1984	3	0	0
Fall 1985	2	0	0
Winter 1985–1986	4	1	25
Spring 1986	10	4	40
Summer 1986	12	1	8
Fall 1986	13	2	15
Winter 1986–1987	11	7	64
Spring 1987	10	4	40
Summer 1987	7	0	0
Fall 1987	12	0	0

tion, it was still present in epornitic proportions. Prevalences of poxvirus in California quail, unlike in other species of quail, seemingly were related to the age of birds. The seasonal pattern of prevalence found from 1975 to 1979 was confirmed during this study.

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