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## AVIAN POX IN CALIFORNIA QUAIL FROM OREGON

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**Abstract:** California quail (*Lophortyx californicus*) from several locations in Oregon were examined seasonally between fall 1975 and summer 1978 for avian pox. Pox lesions were present on 66 of 256 (26%) birds from the E.E. Wilson Wildlife Area. None of the remaining 41 birds from other areas was infected. Rates of infection of males and females were equal; juveniles had a slightly, but not significantly, higher prevalence of pox than did adults.

### INTRODUCTION

Avian pox, a disease common to domestic gallinaceous birds, was reported to occur in wild populations of bobwhite (*Colinus virginianus*)<sup>4</sup> and Gambel's quail (*Lophortyx gambelii*),<sup>1</sup> but not in other species of North American quail. Incidental to a study on the factors affecting California quail (*L. californicus*) populations in western Oregon<sup>2</sup> was the discovery of avian pox in this species. Consequently, the prevalence of avian pox in California quail from several locations in Oregon was examined between 1975 and 1978.

### MATERIALS AND METHODS

The study was conducted primarily on the E.E. Wilson Wildlife Area, a state-operated refuge and game farm, located 16 km north of Corvallis, Benton County, Oregon. Quail were collected seasonally by trapping or shooting from fall 1975 through summer 1978, except for spring and summer 1976. Birds, trapped during one season and recaptured or shot during a subsequent season, were treated as separate observations. Recaptures within a season were not included in the analysis. A total of 256 quail (283 observations) from the E.E. Wilson Wildlife Area was examined. Additionally, 20 quail were shot in Benton (9), Linn (2), Polk (1), and Yamhill (8) Counties and 21

quail were shot in Morrow (16) and Umatilla (5) Counties between spring 1975 and winter 1977-78.

Most cases of avian pox were diagnosed in the field by gross examination; however, quail with epidermal lesions of a questionable nature were submitted to the Oregon State University Veterinary Diagnostic Laboratory for examination. Lesions from infected birds were fixed in 10% buffered formalin for 24 h, sectioned at 5 $\mu$ m, and stained with hematoxylin-eosin for histopathologic evaluation. Where indicated, bacteriologic cultures were made.

Chi-square analysis<sup>3</sup> was used to test for differences in rates of infection between adults and juveniles and between males and females. Results from shooting and trapping were analyzed separately. Age ratios of birds which were shot during summer were excluded from calculations because only adult birds were collected.

### RESULTS AND DISCUSSION

Sixty-six of 256 (26%) different individuals from the E.E. Wilson Wildlife Area and none of 41 birds from other areas were infected with avian pox. Results from the sample of birds shot on the E.E. Wilson Wildlife Area indicated a prevalence of 14%, whereas 34% of trapped birds were infected (Table 1).

TABLE 1. Prevalence of pox in California quail, E.E. Wilson Wildlife Area, Oregon, 1975-1978.

Season	Collection Method	Number Examined	Number with Pox	(%)
Fall 1975	Shot	20	0	(0)
Winter 1975-76	Trapped	10	2	(20)
Fall 1976	Shot	23	0	(0)
Winter 1976-77	Trapped	32	10	(31)
Spring 1977	Shot	6	2	(33)
Spring 1977	Trapped	33	13	(39)
Summer 1977	Shot	15	2	(13)
Summer 1977	Trapped	6	1	(17)
Fall 1977	Shot	21	3	(14)
Fall 1977	Trapped	38	18	(47)
Winter 1977-78	Shot	16	8	(50)
Winter 1977-78	Trapped	23	8	(35)
Spring 1978	Shot	9	2	(22)
Spring 1978	Trapped	7	0	(0)
Summer 1978	Shot	10	0	(0)

Seemingly, the prevalence of pox was unrelated to sex ( $P > 0.75$ ) or age ( $P > 0.10$ ) of the birds. Nevertheless, a trend which indicated a higher proportion of juveniles among infected birds was apparent. Seasonal prevalence of infection varied from 0 to 50% (Table 1). Infection was lowest during summer which coincided with the driest part of the year in western Oregon.

All infected birds possessed lesions on the feet or tarsi. Additionally, a lesion on the epidermis of the tibiotarsus was found on one bird and another individual had a lesion near the left eye. No evidence of wet pox involving the mouth or upper respiratory tract was found in any of the four birds examined. In bobwhites, Stoddard<sup>4</sup> found that lesions usually occurred on legs. Contrastingly, Blankenship, *et. al.*<sup>1</sup> observed pox lesions only on the heads of Gambel's quail.

Microscopic examination of the lesions revealed a proliferative process involving the stratified squamous epithelium characterized by ballooning of individual epithelial cells which contained large eosinophilic intracytoplasmic inclusion bodies (Bollinger bodies). Associated with this condition

were superficial necrotic debris and, in the dermis, varying degrees of inflammatory response characterized by edema and leukocytic infiltration. *Staphylococcus aureus*, probably reflecting secondary invasion, was isolated from lesions on two quail.

Fowl pox was detected on the heads and feet of gray partridges (*Perdix perdix*) imported to the E.E. Wilson Wildlife Area in 1956 (T.P. Kistner, pers. commun.). Personnel of the Oregon Department of Fish and Wildlife conducted serological tests for pox in pheasants and partridges annually until the 1970's; no infected birds were found (D. Kirkpatrick, pers. commun.). However, incidental to trapping for quail, fowl pox was discovered in one of five female ring-necked pheasants (*Phasianus colchicus*) captured during April, 1978.

Previous documentation of avian pox in game farm birds on the E.E. Wilson Wildlife Area, the relatively high prevalence of pox among California quail on that area, and the absence of infected birds from other locations tend to indicate a relationship between pox in quail and game-farming activities.

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