Prepared and distributed by the Vector-Borne Disease Section
Division of Communicable Disease Control
California Department of Public Health
916.552.9730•www.cdph.ca.gov/programs/vbds

Oropsylla montana, a common flea of ground squirrels in California and the primary vector for plague

California Plague Report, Summer 2011

The California Department of Public Health (CDPH) collaborates with local, state, and federal agencies to conduct a statewide plague surveillance program. The CDPH, Vector-Borne Disease Section (VBDS) collects, collates, and analyzes information on suspect and confirmed plague activity among humans, domestic pets, and wild animals throughout California. This mid-year report summarizes plague activity in California through July 31, 2011.

Human surveillance

No cases of plague in humans have occurred thus far in 2011.

Domestic pets

On July 15, a domestic cat from the Beckwourth area of Plumas County was presented to a local veterinary clinic with fever, cervical edema/cellulitis, and a fluctuant submandibular abscess. Plague was suspected and an aspirate of the abscess was sent to the Laboratory Response Network (LRN) reference laboratory. On July 17, the LRN lab reported detecting *Yersinia pestis* by direct fluorescent antibody assay and PCR. The cat was placed in isolation at the clinic and treated with the appropriate antibiotics and survived. Although the cat had no overt signs of pneumonic involvement, the veterinarian, veterinary staff, and cat's owners were advised to contact their health care providers for antibiotic prophylaxis. Plumas County health officials provided a press release to the public discussing the risks of endemic plague exposure to humans and pets. Plague in domestic felines is of concern in the Sierra Valley regions of Plumas and Sierra Counties, and in the Truckee area of Nevada County. Plague infection has occurred in 5 of 14 domestic cats tested from this region since 2001.

On June 30 a domestic dog from the Lake Isabella area of Kern County presented to a local veterinary clinic with clinical signs suggestive of plague. Subsequent testing conducted at the local LRN lab and U.C. Davis were negative. No additional domestic pets have been tested for plague thus far in 2011.

Wild animals

Between January 2 and July 31, 2011, the VBDS plague surveillance program received test results for 42 wild rodents and 53 carnivores from 11 California counties (see Table 1). The 42 rodents included: 19 California ground squirrels from two counties, 2 Belding's ground squirrels, 6 chipmunks from three counties, 12 mice, 2 woodrats, and a kangaroo rat. All rodents were negative for plague antibody.

The 53 carnivores tested included: 39 coyotes from four counties, 5 raccoons from two counties, 2 mountain lions from two counties, 6 black bears, and a bobcat. A black bear from Mariposa County and two coyotes from Modoc County tested positive for antibodies to *Yersinia pestis* (1:64, 1:32, and 1:32, respectively). All other carnivores were negative for serum antibody to *Y. pestis*. Additionally, 4 feral pigs from one county tested negative.

These results do not include data collected from plague surveillance programs of local agencies that conduct their own testing.

Table 1. VBDS plague surveillance results through July 2011

County Location	No. rodents	No. carnivores	Positive specimens Species	Result	Month
Glenn	2				
Inyo	1				
Kern		21			
Los Angeles		5			
Mariposa		6			
Yosemite NP: Yosemite Valley			Black Bear	1:64	May
Mendocino		1			
Modoc	2	13			
Eagleville: 5E			Coyote	1:32	January
Lake City: 5NE			Coyote	1:32	January
Plumas					
Beckwourth: 4N			Domestic Cat	POS	July
Riverside	18				
San Bernardino	19				
San Luis Obispo		1			
Shasta		6			
Total	42	53			

POS: *Yersinia pestis* bacteria

Editorial Comment

Plague activity in California

During the winter and spring of 2011, many areas of California experienced above average rainfall and snow (California Department of Water Resources data, http://cdec.water.ca.gov/cgi-progs/products/PLOT_ESI.2011.pdf and http://cdec.water.ca.gov/cgi-progs/products/PLOT_FSI.2011.pdf). The increased precipitation resulted in increased flora production and food resources for rodents. For some of these areas, such as the Modoc Plateau, this has produced a concurrent increase in sylvatic rodent numbers. In other areas, such as the southern Cascades, rodent populations do not appear to have increased. Temperature and moisture patterns across the state assist in the maintenance of factors affecting flea and rodent abundance and the continuation of natural plague foci and activity. Some areas of California could experience an upswing in plague activity if and when annual precipitation decreases and rodent populations are stressed by shrinking resources.

Sylvatic plague continues to show signs of activity in many endemic areas of northern California and in the Sierra Nevada mountains. Plague antibodies detected in Yosemite Valley black bears (1pos/6 tested, 17%) have not been observed since 2007 (2 pos/23 tested, 9%). In recent years the highest activity in black bears from this region occured in 1999 when plague antibody was found in 24% (8/33) of bears tested. Seropositive coyotes from Modoc County's Warner Mountains suggests continued activity in the region. Plague activity observed in coyotes from Modoc County has declined from 44% (16/36) in 2007 to 2% (1/49) in 2010. Thus far this year, observed plague exposure in coyotes is 15% (2/13). Plague activity in this area may be widespread and extend north into southern Oregon (See Oregon plague activity below).

The last two years have seen a decline in sampling for endemic plague in California that may bias surveillance results. This decline is due, in part, to a reduction in resources to conduct surveillance by collaborating agencies.

The need for timely and comprehensive plague surveillance and control guidelines for local programs in California prompted VBDS to provide an addendum to the California Compendium of Plague Control. Entitled “Guidelines for Local Plague Surveillance and Control Programs in California”, the information provides a quick reference to protocols and procedures specific for local agencies with plague surveillance and control programs. This information can be found at: http://www.cdph.ca.gov/HealthInfo/discond/Documents/Plaguesandcguidance06-11.pdf.

Plague activity elsewhere in the United States
Continued plague activity in wild rodent populations within historically active regions of New Mexico has resulted in two human cases thus far in 2011 (New Mexico Department of Health). In May, two men (58 and 78 years old) from the Santa Fe County area were hospitalized and subsequently survived bubonic plague after suffering reported flea bites. Thus far in 2011, New Mexico has had five domestic dogs and cats reported with plague infection. In 2010, a total of ten domestic cats and ten domestic dogs were reported with plague. No human cases of plague were reported from New Mexico in 2010 (New Mexico Department of Health).

In late May, Boulder Colorado health officials reported that a domestic cat contracted plague after bringing home a plague infected tree squirrel (Boulder County Public Health). The cat was treated with antibiotics and survived. Plague occurrence in the cities of Boulder and Denver involves peridomestic fox squirrels (*Sciurus niger*). The exact mechanisms that allow the maintenance of plague in these animals are poorly understood.

In August of 2010, Oregon health officials reported two human cases of plague in 17 and 42 year old patients from Lake County (Lake County Public Health Department, CDC, MMWR: 60:214, 2011). Both patients were reportedly bitten by fleas from their dog that also tested positive for plague exposure. After antibiotic treatment, both patients recovered. This year plague was detected in a domestic cat from the Prineville area of Cook County (KTVZ.Com). The cat was treated with antibiotics and survived.

Worldwide plague activity, 2011
In March 2011, officials reported that 3 people died from plague in Ambohimangakely [Antananarivo] province of Madagascar. One of them, an eight year old girl, died from pneumonic plague. Plague occurs in Madagascar almost every year, with outbreaks taking place between October and April, when the combined effects of the rainy season and drought affect the food supply, taxing hygienic conditions that allow commensal rats to enter the villages (ProMED 20110318.0858). The Madagascar Ministry of Health reported 310 cases of plague resulting in 49 deaths from the beginning of 2011 to the end of March (UNICEF: Madagascar, April 2011).

Vector Borne Disease Section
VBDS
California Department of Public Health