

NOTE Pathology**An Epizootiological Survey of Necropsy Cases (1993–1997) at University of the Philippines**Susumu TATEYAMA, Helen A. MOLINA¹⁾, Kazuyuki UCHIDA, Ryoji YAMAGUCHI and Mauro F. MANUEL¹⁾*Department of Veterinary Pathology, Faculty of Agriculture, Miyazaki University, Miyazaki 889–2155, Japan and ¹⁾Veterinary Paraclinical Sciences, College of Veterinary Medicine, University of the Philippines at Los Banos College, Laguna, the Philippines*

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ABSTRACT. An epizootiological survey of necropsied cases (1993–1997) at University of the Philippines was performed. A total of 368 cases included 238 avian and 111 porcine cases. Amongst avian cases, the major cause of death was infectious diseases in 212 (89%) cases including 97 (41%) bacterial, 36 (15%) viral, and 21 (9%) parasitic diseases. The majority of the avian bacterial diseases presented as septicemia (73 cases) and the viral diseases as Newcastle disease (17 cases). In porcine cases, the major cause of death was also infectious diseases, in 100 (90%) cases including 52 bacterial and 29 viral diseases. Porcine bacterial diseases were classified into 36 septicemia, 4 hemophillosis and 4 colibacillosis. Amongst the porcine viral diseases, most cases were diagnosed as Hog cholera (22 cases).—**KEY WORDS:** avian disease, Philippines, porcine disease.

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In the Philippines, the prevention of infectious animal disease is the biggest problem in the veterinary field. There have been many reports concerned with animal disease on the islands, including ebola viral infection amongst exported monkeys [2, 7, 8], but there are few epidemiological data that help us to understand the situation in livestock such as pigs and broiler chickens [6].

This survey was performed retrospectively, using the necropsy records between 1993 and 1997 at University of the Philippines, to determine the characteristics of diseases in domestic animals.

Between 1993 and 1997, a total of 368 cases were presented to the Department of Veterinary Paraclinical Sciences, the College of Veterinary Medicine, University of the Philippines, for necropsy. Out of these 368 cases, 238 (64%) were avian, mainly broiler chickens and 111 (30%) were porcine (Table 1). The rest were canine (nine cases), caprine (three cases) and other species (seven cases). Almost all the avian and porcine cases were less than one year old at necropsy. The diagnoses of the necropsied cases were based on both pathological and serological examinations. All data in this study were based on previous necropsy records at the Department of Veterinary Paraclinical Sciences, College of Veterinary Medicine, University of the Philippines.

Avian diseases: The summary of avian diseases recorded is represented in Table 2. Out of 238 necropsied avian cases, most of them were involved in infectious diseases (212 cases/89%). These were divided into bacterial (97 cases/41%), viral (36 cases/15%) and parasitic diseases (21 cases/9%). The details of both the bacterial and viral avian diseases are shown in Table 3. Amongst the avian bacterial disease (97 cases), the majority of cases presented as bacterial septicemia (73 cases), characterized by hemorrhagic and inflammatory changes to multiple organs and sometimes accompanied by fibrinous suppurative

pericarditis and peritonitis. The next most frequent disease was colibacillosis (13 cases) characterized by severe diffuse hemorrhagic enterocolitis. Three cases of salmonellosis were also recorded. Of the avian viral diseases (36 cases), Newcastle disease was the most commonly recognized (17 cases), although the incidence decreased in 1997. In contrast, the incidence of infectious bursal diseases (ten cases) increased from 1996. The other avian viral diseases were infectious bronchitis, avian encephalitis and Marek's disease, which were all recorded in one case each (Table 3). Amongst the avian parasitic diseases (21 cases, Table 2), coccidiosis was the most frequent (13 cases), and a few cases of avian malaria (two cases) and helminthiasis (two cases) were recorded.

Of the avian diseases other than infection, nine cases were diagnosed as nutritional defect (Table 2), with hypovitaminosis E, characterized as encephalomalacia, recorded in two cases. In most of the cases classified as "others" in Table 2, no significant lesions were observed to suggest the diagnosis.

Porcine diseases: The summary of porcine diseases recorded between 1993 and 1997 are shown in Table 4. In 111 porcine cases, the major disorders were infectious diseases (100 cases, 90%), which were divided into bacterial

Table 1. Number of necropsied cases from 1993 to 1997 at University of the Philippines

	1993	1994	1995	1996	1997	Total
Avian	54	69	16	40	59	238 (64%)
Porcine	36	30	2	21	22	111 (30%)
Canine	2	2	0	3	2	9 (12%)
Caprine	2	1	0	0	0	3 (1%)
Others	0	2	0	2	3	7 (2%)
Total	94	104	18	66	86	368

Table 2. Avian diseases recorded from 1993 to 1997 at University of the Philippines

	1993	1994	1995	1996	1997	Total
Infectious disease	47	63	15	32	55	212 (89%)
Bacterial	22	36	8	8	23	97 (41%)
Viral	8	12	1	5	10	36 (15%)
Parasitic	4	5	1	6	5	21 (9%)
N.S*.	13	10	5	13	17	58 (24%)
Nutritional	4	3	0	2	0	9 (4%)
Others	3	3	1	6	4	17 (6%)
Total	54	69	16	40	59	238

*N.S.: The causative agents were not specified.

Table 3. The details of avian infectious diseases

	1993	1994	1995	1996	1997	Total
Bacterial disease	22	36	8	8	23	97
Septicemia	16	27	8	7	15	73 (75%)
Colibacillosis	3	3	0	1	6	13 (13%)
Others	3	6	0	0	2	11 (11%)
Viral disease	8	12	1	5	10	36
Newcastle disease	8	12	1	5	10	36
I.B.D*	0	0	0	4	6	10 (28%)
Others	2	5	0	0	2	9 (25%)

*I.B.D.: infectious bursal disease.

Table 4. Porcine diseases recorded from 1993 to 1997 at University of the Philippines

	1993	1994	1995	1996	1997	Total
Infectious disease	34	29	2	15	20	100 (90%)
Bacterial	16	15	0	11	10	52 (47%)
Viral	14	9	0	3	3	29 (26%)
Parasitic	1	1	0	0	2	4 (4%)
N.S*.	3	4	2	1	5	15 (14%)
Others	2	3	0	6	4	11 (10%)
Total	36	30	2	21	22	111

* N.S.: The causative agents were not specified.

(52 cases, 47%), viral (29 cases, 26%) and parasitic diseases (four cases, 4%, Table 5). Bacterial diseases (52 cases) were classified into septicemia (36 cases), hemophillosis, which was characterized by fibrinous-suppurative pleuropneumonia (four cases) and colibacillosis (four cases). Almost all the porcine viral diseases (29 cases) were diagnosed as Hog cholera (22 cases). The viral diseases other than Hog cholera were transmissible gastroenteritis (TGE, two cases), parvoviral infection (one case), and foot and mouth disease (recorded in 1997, one case). Amongst parasitic diseases (four cases, Table 4), coccidiosis (two cases) and nematodiasis (two cases) were recorded. In the

cases classified as "others" in Table 4, there were no significant lesions (eight cases) or some traumatic lesions (three cases).

Diseases in other animal species: In addition to broiler chickens and pigs, dogs (nine cases), sheep (three cases), and seven other animal species were presented for necropsy. In these cases, there was no specific occurrence of diseases, although almost all canine cases had pneumonia, and presumably some of these were related to canine distemper infection.

This paper partly demonstrates the current situation of animal diseases, especially in broiler chickens and pigs in

Table 5. The details of porcine infectious diseases

	1993	1994	1995	1996	1997	Total
Bacterial disease	16	15	0	11	10	52
Septicemia	12	10	0	9	5	36 (47%)
Hemophillosis	2	1	0	1	0	4 (11%)
Colibacillosis	1	0	0	1	2	4 (11%)
Others	1	4	0	0	3	8 (8%)
Viral disease	14	9	0	3	3	29
Hog cholera	12	7	0	3	0	22 (76%)
Others	2	2	0	0	3	7 (24%)

the Philippines. The Office International des Epizooties (O.I.E., world animal health organization) provides information on internet (<http://ss.niah.affrc.go.jp/OIE>) on the major infectious animal diseases since 1992 in the Asian and Pacific countries, including the Philippines. However, there are few reports concerned with the epidemiology of animal diseases on the islands. Our study showed that approximately 90% of broiler chickens and pigs examined at University of the Philippines suffered from an infectious disease, most of which were caused by bacterial or viral infections. Schistosomiasis, caused by *Schistosoma japonicum (philippines)*, is known to be one of the common zoonotic diseases in the Philippines [1, 4], but such parasitic diseases affected a minor population of this study.

In cases of both species, which were almost broiler chickens and pigs, bacterial diseases were the most serious problem, caused in the majority by septicemia, which was characterized by generalized hemorrhage and inflammatory changes. One of the major causative agents of hemorrhagic septicemia is *Pasteurella multocida*, but there were no data on bacterial isolation in this study. In the reports issued by O.I.E. both serological evidence and severe outbreaks of hemorrhagic septicemia amongst the Philippines livestock is shown. These findings indicate that *Pasteurella multocida* is wide-spread in animal farms, especially broiler farms. Colibacillosis, which is usually caused by pathogenic *Escherichia coli (E. coli)* infection, was the second most frequent bacterial disease in both broiler chickens (13%) and pigs (11%) in this study. In a previous study, Echeverria *et al.* [3] investigated the status of contamination of enterotoxigenic *E. coli* in humans, livestock, food and water, in a Philippines community. In their study, they isolated enterotoxigenic *E. coli* from two out of 28 pigs and one out of ten water buffalo, but there were no data on avian cases. In addition, Joya *et al.* [6] described outbreaks of diarrhea due to enterotoxigenic *E. coli* infections in broiler chickens at two independent farms in the Philippines. These previous findings, together with our present data, may strongly indicate that there is a high level of contamination of pathogenic *E. coli* in both broiler and porcine farms in the Philippines.

Johnson *et al.* [5] looked for viscerotropic velogenic Newcastle disease amongst several avian species in the Philippines. They attempted viral isolation on 728 cloacal

samples, but Newcastle disease virus was only isolated from a single domestic chicken, suggesting very limited contamination of the virus amongst birds in the Philippines. In contrast, Newcastle disease was the most frequent avian diseases (17/36 cases) in our study. The incidence of Newcastle disease in 1997 was also very high in the O.I.E. report. Their data may support our findings and indicate that the virus is very wide-spread in broiler farms. Interestingly, the incidence of Newcastle diseases decreased in the three years between 1995 and 1997 and the major avian viral disease from 1996 was infectious bursal disease. As our samples were collected from a limited area around Laguna, it is difficult to refer to the significance of this trend. It may be possible that the vaccine program for Newcastle disease has reduced the incidence of the disease in the broiler farms around Laguna. On the other hand, Hog cholera is the most serious porcine viral disease in the Philippines. In addition, foot and mouth disease was also recorded in 1997. These two porcine viral diseases have enough potential to cause serious outbreaks, resulting in large economic loss. Therefore, the elimination of these diseases is quite important and immediate effective enforcement, including the complete disposal of infected animals, vaccination programs, and hygiene controls, is strongly recommended.

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