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Goat melioidosis in Taiwan: Clinical and pathological findings

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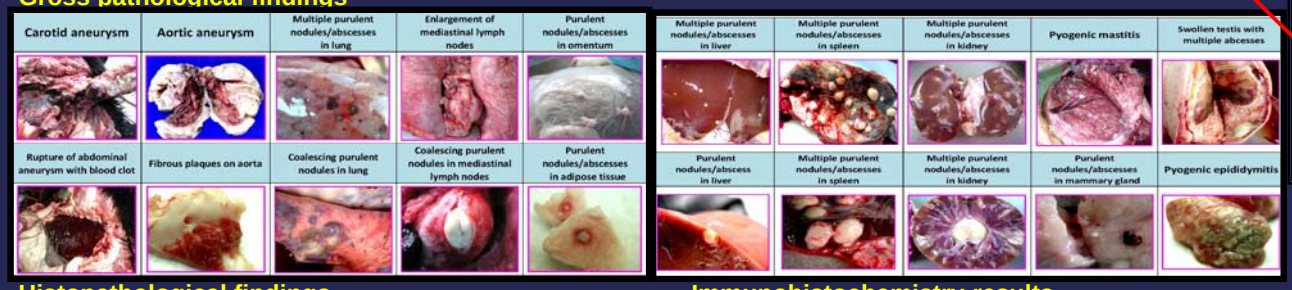
Introduction

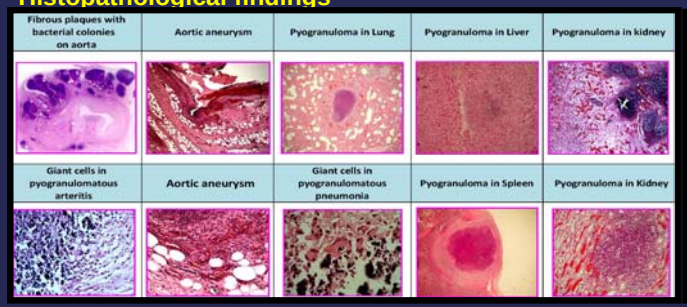
Burkholderia pseudomallei is the etiological agent of melioidosis, a severe and fatal disease both in human and animal. The first outbreak of animal melioidosis occurred in a government goat farm located on the southern Taiwan during the rainy seasons in 2006. For the farm was opened to tourists, it raised public health risk issues and caused a great turmoil consequently. Also, because the test-and-slaughter control measure was implemented, it caused huge economic losses.

Clinical signs of goat melioidosis

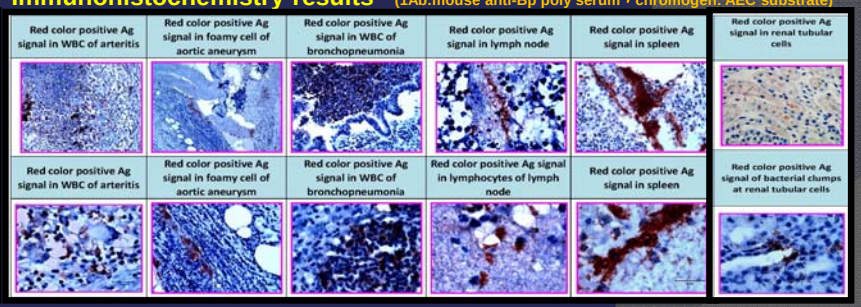
Gross pathological findings



Histopathological findings



Immunohistochemistry results (1Ab:mouse anti-Bp poly serum，chromogen: AEC substrate)

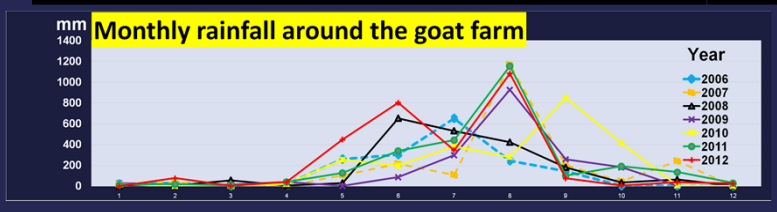


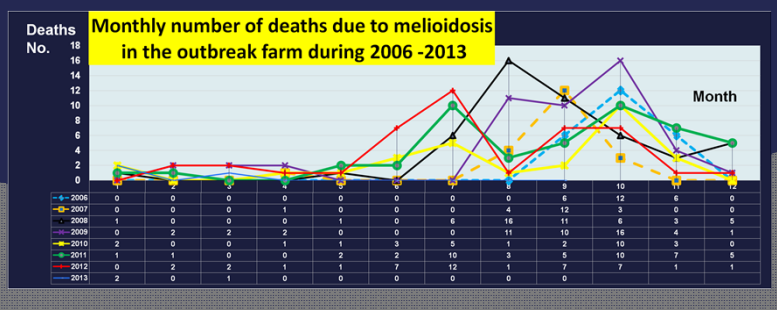
Methodology and results

After 2006, all suspected dead goats were sent for definite diagnosis in our laboratory by pathology, microbiology and other examinations. The 55% of the cases was culture confirmed infecting the *Burkholderia pseudomallei* (Bp). These goats showed clinical signs including fever, dullness, anorexia, diarrhea, extreme emaciation, coughing, nasal discharge, respiratory distress, lameness, swollen testicles, mastitis, and abortion. The majority of the incidence concentrated from June to December, when wet season prevails with frequent typhoons in southern Taiwan. The age groups susceptible to infection ranged from around 1-month-old to 10-year-old among various goat breeds. At necropsy, single or multiple yellowish-white and creamy purulent nodules/abscesses were found on various organs including the lung, spleen, liver, lymph nodes, mammary gland, and kidneys. Thoracic and abdominal aortic aneurysm rupture was also noticed. Immunohistochemistry results revealed that Bp antigen present not only in phagocytic cells but also in parenchymal cells. We isolated the bacteria from nasal discharge, urine, milk, and feces of infected animals and detected the genomic markers by real-time PCR from water, soil, and local hay. By using multi-locus sequence typing (MLST) method, ST57、ST58、ST91 and one novel ST genotype were identified from a total of 30 isolates.

Location of outbreak farm

Lat.:21˚ 57'
Long.:120˚ 48'





MLST genotypes reported from goat cases in Taiwan

MLST Genotype	No. of strain(%)	Distribution
ST57	4(13.33%)	France, Philippines
ST58	16(53.33%)	Malaysia, Thailand
ST91	4(13.33%)	USA
novel ST	6(20%)	Taiwan

MLST genotypes reported from human cases in Taiwan

MLST Genotype	No. of strain (%)	Distribution
ST50	1(9.1%)	China, Malaysia, Thailand
ST58	7(63.6%)	Malaysia, Thailand
ST67	1(9.1%)	Singapore
ST99	1(9.1%)	USA, Philippines, Malaysia, Thailand
ST451	1(9.1%)	Taiwan

Discussion

Among the above mentioned 4 Bp genotypes of goat isolates, ST91 genotype had reported from American human case, while ST57 and ST58 were widely spread in Asia. ST58 genotype should be more attention because it had been isolated from human melioidosis case in Taiwan. Although 3 out of 4 genotypes were previously reported from human cases, none of the farm workers or visitors got infected in the past 6 years.