Mycoplasma to pass through bacterial membrane filters

Art & Culture

MYCOPLASMAINTRODUCTION? Mycoplasma coming under the classMollicutes. There are 9 genera in theclass Mollicutes. Thus class Mollicuteshave 3 families are Mycoplasmataceae, Acholeplasmataceae, Anaeroplasamataceae .

From that 9 genera , 5 are veterinary importance (Mycoplasma, Ureaplasma, Acholeplasma, Anaerplasma, Asteroplasma) . There are 100 spp in the Mycoplasma genus . First Mycoplasma identified in 1890 was Mycoplasmamycoides subsp mycoides . Similar types of Mycoplasmas were subsequently identified called as Pleuro Pneumonia LikeOrganisms (PPLO) ? Generally Mycoplasma are Prokaryotes, have capable of replication. Pleomorphic organisms which will appear as spherical , filaments . They do not have cellwall so they cannot synthesizes peptidoglycan. However they have 3 layered flexible outer membranewhich will causes the flexibility property of that organism .

Flexibility : Allows to pass through bacterialmembrane filters (0. 22 to 0. 45µ) .

Sensitive to heat , dessication, detergents but they resistant to penicillinHABITAT: -Found onmucosal surfaces of conjunctiva , nasal cavity, oro-pharynx , intestinal, genital tract . these are extracellular organisms. Generally host specific in naturePATHOGENESIS: -Parasiticmycoplasms tend to adhere firmly to host’ s mucous membrane (adhesin) .

There they produce haemolysins, proteases, nucleases, other lethal factors that leads to death of cells. Some mycoplasmal organisms have predilection site in mesenchymal cells -joints, serous cavities.

Respiratorytract and lungs – frequent site of thepathogenic organisms . It destroys the cilia of respiratorytract thereby causes 2° bacterialinvasion .

Latency can occur in that microbial pathogenecity . Stress , intercurrent infection & agepredisposes the disease . Infections may be chronic or low grade andthey are exogenous or endogenousLABORATORY DIAGNOSIS: - Specimens:? Samples are fragile in nature , it should be kept at refrigerated condition and delivered to a laboratory within24 – 48 hours of collection . Samples : Mucosalscrapings, tracheal exudates, aspirates, pneumonic tissue from the edge of lesionCavity or joint fluids, mastitis milkIsolation : -Culturemedia: Mycoplasma are fastidious organisms, facultative anaerobes, 5-10% CO?. It requires enriched media forgrowth . Basic medium is a goodquality beef infusion with supplements pH of the medium – 7.

2 to 7. 8. Commercially available agar or broth(supplemented with horse serum 20% and yeast extract with amino acid).

Penicillin– inhibition of gram +ve Thallous acetate- inhibition of gram –ve , fungi. Specimenshould be inoculated into 2 broths and onto (2 agar plates 1 for mycoplasm, 1for urea plasm). Fluid material (fetal fluids , exudates)-directly inoculatedinto broth and agar mediumSome specimens (semen, joint fluids, tissues) containinhibitors of mycoplasmsBoth undiluted specimen & ten fold dilutions inmycoplasmal broth should be culturedIDENTIFICATION: - Differentiation from bacterial L forms ???? Bacteria temporarily failed to form cell walls (Lforms) can produce microcolonies similar to the mycoplasms . Staining microcolonies with Diene ‘ sstain – aids in

differentiation between L and mycoplasmal colonies . Mycoplasmal colonies retain stain Lform decolorise within 15 mins COLONIAL MORPHOLOGY: - Microscopically:? Fried egg colonies? Diene ' s stain – recognizesmicrocolonies ? Inoculated agar plates placed in ahumid atm. at 37°C? umbonate micro colonies when illuminated obliquely? Microcolonies – fried eggappearanceIDENTIFICATION OF THE GENUS: -Sensitivityto digitonin ???? Mycoplasma and urea plasma aresensitive to digitonin? Done by digitonin disc applied onthe agar media ? Positive – Zone of inhibition shouldbe 5 mm or moreIDENTIFICATION OF SPECIES: -Fluorescentantibody staining:? To identify M. dispar and Urea plasm- bronchial epithelium of calves FA (directand indirect) for staining mycoplasmal colonies : q For recognizing mixed culturesq commonly used in avian mycoplasms? Enzyme linked immunoperoxidase:? Porcine bronchial epithelium –M. hyopneumoniae ? AGID- Using known antisera to detect mycoplasmal ag ? ELISA – ag identification with knownantisera ? Species specific DNA probes are available? Biochemical tests ? glucose fermentation , argininehydrolysis , phosphatase activitySEROLOGICALTEST Antibioticssusceptibility:? Although it develop resistant toantimicrobial drugs? So ABST not usually performed? Tylosin, tetracyclin, tiamulin, fluroquinolones used for treatment ? Specific pathogen free (SPF)programmes ? Established for poultry and pigherds? 2 phases in these programmes ???? Detection of infections and cullingor isolation of affected animals? Followed by serological monitoringof the flocks to demonstrate continued freedom from infection CBPP? CHARACTERISTIC STANCE – Head, neck, extended and elbow abductedPostmortem

lesions ???? Lungs – marbled appearance? Grey , red consolidated lobulesalternate irregularly with pink emphysematous lobules? Chronic : fibrinous encapsulation of necrotic foci(viable mycoplasms)? Break down of capsules is major factor in the persistenceand spread of CBPP? Joints – fibrin in synovial space& articular cartilage erosion CCPP: -? Highly contagious? incubation period : 6-10 days ? Transmission ???? Direct contact? Carrier animal may exist? PM lesions ???? Granular lung appearanceFibrinouspneumonia CRD: -? Highly versatile and successfulpathogen? Once infected, it remains for life? Transmission ???? Vertical transmission? Economically significant disease ? PM lesions:? sinusitis, conjunctivitis, tracheitiswith excessive mucous , air sacculitis , pneumonia , synovitis, osteomyelitis