RT-11: CURRENT VESICULAR DISEASES IN LATIN AMERICA VETERINARY MEDICINE

1. VESICULAR STOMATITIS

Alejandro Lopes
Centro Panamericano de Febre Aftosa. RJ

2. THE DIFFERENTIAL DIAGNOSIS OF VESICULAR DISEASES

Jorge W. López
Foot and Mouth Disease Center, Rio de Janeiro, Brasil

There are four vesicular diseases of domestic livestock: Foot and Mouth Disease (FMD), Vesicular Stomatitis, Swine Vesicular Disease and Vesicular Exanthema of Swine. The typical lesion is a vesicle and laboratory assistance is required for a differential diagnosis.

In addition there are hemorrhagic diseases with mucosal erosions like in Bluetongue, Akabane, Epizootic Hemorrhagic Disease of Deer and Ibaraki. Also there are diseases of the respiratory tract that can produce lesions in the mucosas as in Malignant Catharral Fever and IBR. Ulcerative gastroenteritis can also produce lesions in the mucosal surfaces as in BVD, Rinderpest, Peste de Petit Ruminants, Jembrana Disease and mycotoxicoses. Finally there are non-vesicular diseases with primary lesion in the skin as the poxviruses infections, Herpes Mamillitis, Sweating Sickness and fungal toxins (Bocopa). Some of these diseases are exotic to South America.

With the new epidemiological situation of FMD in the continent and the perspective of disease eradication, every outbreak showing sick animals with lesions compatible with a vesicular condition must be carefully studied and a final diagnosis reported promptly so the strict sanitary measures can be lifted.

There are direct and indirect tests. With the direct tests the viral particles or their components as nucleic acids and proteins can be detected in the sample. These tests include virus isolation, electron microscopy, ELISA, complement fixation, immunohistoquimica, *in situ* hybridization and PCR. The indirect tests detect the immune response of the host against the viral infection. Some of these methods are AGID, virus neutralization, ELISAs, hemoagglutination and EITB. The final diagnosis should be obtained with the use of the combination of direct and indirect tests that better fit the particular needs and conditions of the laboratory.

3. OFFICIAL DIAGNOSTIC USED IN LEGAL LABORATORIES TO VESICULAR DISEASES

Cid de Alencar
LAPA, PE

RT-12: VIRUSES CONTROL BREAKTHROUGH IN TROPICAL FRUITS AND GRAMINEOUS

1. GRAMINAE'S VIROSIS IN BRAZIL

E.Oliveira[1]; J.Schons[2]
[1]Embrapa Milho e Sorgo - CP 151, 35701-970, Sete Lagoas MG, Brazil.beth@cnpms.embrapa.br, [2]UPF - CP 611, 99001-970, Passo Fundo, RS

More than 40 viruses infect economical crops, pastures and weeds in Graminae family (Poaceae). Many of them are restricted to this family. In Brazil the most important Poaceae species that can be affected by virosis are: Maize (12 millions ha); sugarcane (5 millions ha); rice (3,2 millions ha); wheat (1,3 millions ha); sorghum (300 thousand ha), barley, oat, and pastures. Information about virosis in these species are scarce. The viruses identified are: maize dwarf mosaic (poty); maize mosaic (nucleorhabdo); maize rayado fino (marafi); maize rough dwarf (fiji gr. 2); sugarcane mosaic (poty); sugarcane bacilliform (badna); barley yellow dwarf (luteo); wheat spindle streak mosaic (bymo); soil borne wheat mosaic (furo), brome mosaic (bromo). The potyvirus-induced-mosaic reduces maize plants production around 50%. These viruses are transmitted by aphids and can infect many Poaceae species. Their crop outbreaks can be up to 100% of incidence. They are largely disseminated in agricultural areas. Nucleic acid and aminoacids studies from maize potyvirus showed similarities of 81,8 and 89,2% with SCMV-SC and 86,3 and 87,4% with MDMV-B, respectively. The majority of maize cultivars are susceptible to these viruses however, resistance sources are available. The peroxidase activity increased in maize plants infected by these viruses. It was possible, without infection, to discriminate 82% of susceptible inbredlines by the low levels of peroxidase activity. The maize rough dwarf virus was detected in Foz do Iguaçú and Cascavel in 1986. This needs confirmation and evaluation incidence in maize and wheat. Some years ago the potyvirus-

induced-mosaic was very important in sugarcane and was controlled by genetic resistance. Nowadays it is again a problem to sugarcane, sorghum and maize. Among 5 serotypes of barley yellow dwarf, the most common in wheat are: BYDV-pav (transmitted by *Rhopalosiphum* padi) followed by BYDV-mav and BYDV-sgv (both transmitted by *Sitobion* aveane). The soil borne wheat mosaic virus, transmitted by *Polymixa* graminis has high incidence in wheat. Until now, there are no virosis identified in the brazilian rice crop.

2. PAPAYA RINGSPOT VIRUS

Paulo Ernesto Meissner Filho
Embrapa Cassava and Tropical Fruits

In Brazil, the disease known as papaya mosaic is caused by the papaya ringspot virus (PRSV), which produced chlorosis of upper leaves, oily streaks on the stem, rings in the fruits, mosaic, leaf deformation and stunting of the plant. The virus belongs to the family Potyviridae, genus *Potyvirus*, has flexuous particles, ssRNA positive sense. The virus RNA possesses only one open reading frame, which is translated in a polyprotein that is proteolytic processed in another viral proteins. PRSV infects Chenopodiaceae, Caricaceae and Cucurbitaceae and has two strains, strain "p" infects papaya and cucurbit and "w" infects only cucurbit. The 3' terminal of PRSV-p and w has 98,2% in aminoacid homology in NIb gene and 97,7% homology at CP gene, this result confirm that they are strains of the same virus. This virus is disseminated by aphids in the field from papaya to papaya and mechanically transmited in experimental conditions. PRSV-p causes reduction in degree Brix and yield loss of 72%. The virus is quickly disseminate and being able to infect in less than seven months, an entire orchard. For PRSV control different strategies can be used, as: a) roguing, b) using tolerante cultivars, like Cariflora, c) producing seedlings or growing papaya protected from vectors, d) growing around and in the papaya fields corn and *Hibiscus* spp., e) using premunized plants and f) producing papaya transgenics plants resistant to PRSV. So far, the tests with transgenic papayas with CP gene showed that these plants are resistant to some isolates of PRSV. At the moment, there are several ways to control papaya ringspot and this use depends on PRSV epidemiology in each region, economical viability of control and available technology.

3. TROPICAL FRUIT VIRUSES IN THE NORTHEAST OF BRAZIL

J. Albersio A. Lima
Universidade Federal do Ceará, Dept. de Fitotecnia, Laboratório de Virologia Vegetal , Cx. Postal 12.168 Fortaleza, CE 60.356.000, e-mail:albersio@ufc.br, Fone: (-85) 227.0842

The Northeast of Brazil has a great potential to produce tropical fruits all year around, including papaya, *Carica papaya*, passionfruit, *Pssiflora edulis* and banana, *Musa spp*. The passionfruit is a very important fruit crop in the Northeast, but it has been infected with the passion-fruit woodiness virus (PWV) which is responsible for great damage in the crop production in several Brazilian States. The absence of satisfactory control measures and the lack of sources of resistance for the virus in the genus *Passiflora* have stimulated the studies to isolate and develop mild strains to be used in cross-protection programs, as a biological control for the virus. A possible mild strain of PWV was isolated from passionfruit in Ibiapaba Mountain, Ceará. Several other viruses of minor importance have also been detected in passionfruit in Brazil. The cucumber mosaic virus (CMV) is one of the most common in the Northeast and it can be found in mixed infection with PWV, causing severe symptoms. The passionfruit veinclearing virus (PVCV) family *Rhabdoviridae* was also found infecting passionfruit in the Northeast, but its importance in the Region needs to be evaluated.

Papaya is consumed all over the world not only by its nutritional values but also by its medicinal importance. Several factors inhibit the expansion and productivity of this crop, and among them, the virus diseases are considered of great importance. The papaya ringspot virus (PRSV-P) and papaya lethal yellowing virus (PLYV) are the most important viruses in the Northeast. The PRSV-P is considered a limiting factor for papaya production in all the countries where papaya is cultivated, and it was detected in several Brazilian States. The virus was found to reduce the number and weight of fruits per plant by 22% and 60%, respectively. The PRSV-P host range is restricted to *Caricaceae* and *Cucurbitaceae* species. The PLYV was first detected in the State of Pernambuco, but it was already identified in Bahia, Rio Grande do Norte, Ceará and Paraíba. The symptoms caused by PLYV initiate as leaf yellowing on the superior part of the plant and with the disease evolution, the leaves became distorted and chlorotics. The fruits present circular green spots that became yellowing with the time. The PLYV host range is, probably, restricted to the genus *Carica*. The virus was purified and recent results demonstrated that infective virus particles can be found in the soil, in green-house irrigated water and in the seed surface from infected fruits. A new papaya disease named Stick ("Meleira") is probably caused by a virus and it represents a limiting factor for papaya production where it occurs.

Although present in several banana plantations in Brazil, the virus diseases are not considered of great importance, as a consequence of limited informations in the literature. The