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A Note on Wood Pocket Disease of Lime on Bearss Lime (*Citrus latifolia* Tan.) in Shambat, Khartoum State, Sudan

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Abstract: Symptoms of wood pocket disease of lime on Bearss lime trees (IVIA 124), kept in Shambat Research Station, Khartoum State, Sudan were described. These were yellowing of foliage and death of branches, in addition to sectoring of fruits, brown streaks on fruits and finally the death of the tree. Death of several potted seedlings was also observed, irrespective of the rootstock, accompanied by suckering of the rootstock. Branches showed cracking and wood staining with dark substance, typical symptoms of wood pocket. As the disease is a genetic disorder, clones of Bearss lime tolerant to wood pocket should be introduced and evaluated under Sudan conditions. This is the first record of wood pocket disease of lime in Sudan.

Key words: Wood pocket; Bearss lime; incompatibility; Sudan

Wood pocket is a genetic disorder; it is not a transmissible disease. It is a disease of lime and lemon. Symptoms are more severe and develop more rapidly in warm conditions. The life cycle of lime trees, affected by wood pocket, is directly proportional to the prevailing temperatures (Roistacher and Velazquez Monreal, 2012). There are several reports of decline of Bearss lime trees, affected by wood pocket disease in Saudi Arabia, Oman and Belize. Rootstock had little or no effect on the symptoms development (Calavan 1957).

Bove (1988), in his survey of citrus diseases in Sudan, observed longitudinal cracks on Bearss lime tree in the government nursery orchard in Zalinge, West Darfur State, similar to cracks on Bears lime trees affected by wood pocket, but no foliage symptoms. Almost all Bearss lime trees, from budwood introduced into Sudan in 1967-1970, from California USA died. Several clones of Bearss lime, free of wood pocket has been selected in Florida, including the clonal line SPB-7.

However, this clone showed classic wood pocket symptoms in Costa Rica (Roistacher and Velazquez Monreal, 2012**).**

The Bearss lime, *Citrus latifolia* Tan. IVIA 124 clone, was introduced, from Valencia Agronomic Research Institute, Valencia, Spain, in 2003. Bearss lime, kept in Shambat Agricultural Research Station, grafted on sour orange, established normally then started to decline and died in 2007. Symptoms were yellowing of foliage and death of branches, in addition to sectoring of fruits and brown streaks on fruits. Symptoms were also seen in several potted seedlings, irrespective of the rootstock, sour orange or volkmeriana (Fig.1), accompanied by suckering of the rootstock. Removal of the park, at the bud union, revealed death of the scion and brown staining with substance of dark colour (Fig. 2), probably of phenolic nature (Errea, 1998). Typical symptoms of wood pocket disease were observed; cracking of branches and wood staining (Fig3).
Various reports suggested that viroids are responsible for bark cracking of Bearss lime trees in several countries (Murcia *et al*, 2010; Murcia *et al*. (2010; Roistacher and Velazquez Monreal, 2012;).) indicated that bud cracking of Bearss lime in Brazil and Peru did not show tree decline and devoid of wood staining and fruit sectoring associated with wood pocket.
The Bearss lime (IVIA 124) was introduced to Sudan, as disease-free clone, from the highly accredited research institute, Agronomic Research Institute, Valencia, Spain. To exclude involvement of viroids in symptoms recorded in Bears lime, in this study, two trees were indexed for citrus excortis and/ or other viroids. Bark slips from two mature, seedlings of bears lime (IVIA-124), available at the Shambat Research Station citrus germplasm collection, were grafted onto *Citrus medica*; citron 861-S1 (sensitive indicator plant of citrus viroids. Three months post inoculation, no symptoms of citrus excortis and/other citrus viroids were observed. Citron plant inoculated with citrus excortis source, as positive control, was stunted and showed severe leaf epinasty (Fig. 4). The positive control source contains all the citrus viroids reported in Sudan (Mohamed *et al*. 2009). As the disease is a genetic disorder, clones of Bearss lime tolerant to wood pocket should be introduced and evaluated under Sudan conditions.

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Fig.1. Death of Bearss lime on volkmeriana rootstock, the rootstock not affected

Fig.2. Bud union: Death of the scion and survival of the sour orange rootstock and brown staining with substance of dark colour at the line of attachment of the scion and the rootstock

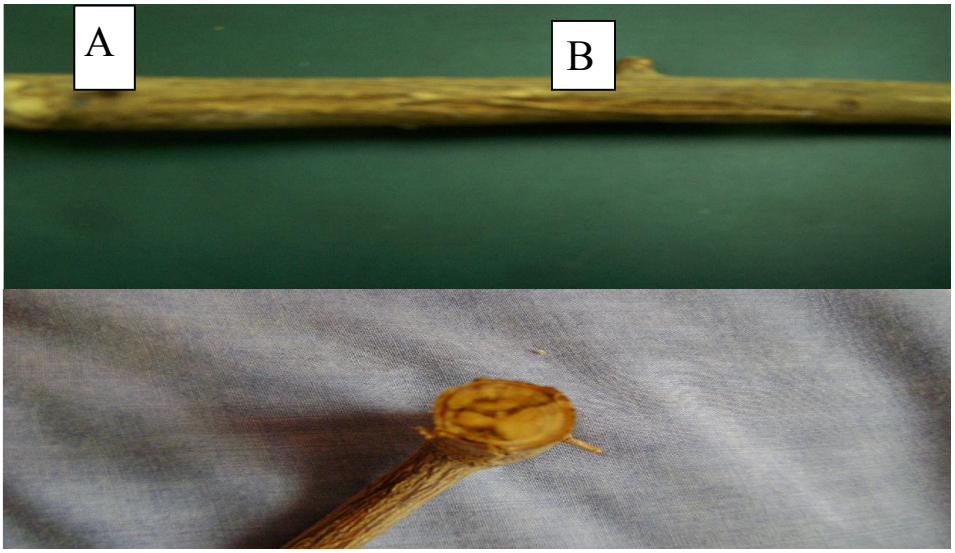

Fig.3. Wood pocket symptom on branches of Bearss lime, (A) branch showing longitudinal cracks, (B) branch showing wood staining

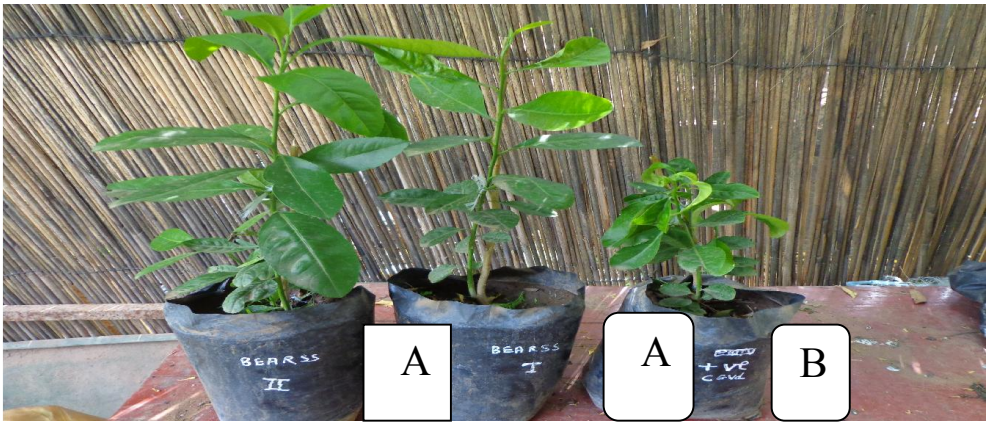

Fig.4. Indexing Bearss lime for citrus excortis and/or other viroids, (A) citron indicator plants show no symptoms of viroids infection, (B) citron positive check shows severe leaf epinasty

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