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# VIRUSES OF STONE FRUIT TREES IN SYRIA

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**SUMMARY-** Surveys were conducted in the main stone fruit areas of Syria to evaluate the sanitary status of varietal collections and commercial orchards. The presence of viruses was demonstrated by ELISA. A total of 1,337 samples were tested (444 apricot, 283 peach, 246 cherry, 222 almond and 142 plum). The overall infection rate averaged 13%. The infection levels for single species were: peach, 24%; cherry, 16%; almond, 13%; apricot, 6%; plum, 5%. The following viruses were detected: *Prunus necrotic ring spot virus* (PNRSV), *Prune dwarf virus* (PDV), *Apple chlorotic leaf spot virus* (ACLSV), *Plum pox virus* (PPV) and *Apple mosaic virus* (ApMV).

**Key words:** Syria, stone fruits, plant viruses, ELISA

**RESUME -** Des prospections ont été effectuées dans les principales régions fruitières de la Syrie afin d'évaluer l'état sanitaire des collections variétales et des vergers commerciaux. La présence des virus a été vérifiée par l'ELISA. Au total, 1337 échantillons ont été testés en ELISA (444 abricotiers, 283 pêchers, 246 cerisiers, 222 amandiers et 142 pruniers). Le taux d'infection moyen total s'élevait à 13%, alors que pour chaque espèce, le niveau d'infection était le suivant: 24% pour le pêcher, 16% pour le cerisier, 13% pour l'amandier, 6% pour l'abricotier, et 5% pour le prunier. Les virus suivants ont été détectés : le *Prunus necrotic ringspot virus* (PNRSV), le *Prune dwarf virus* (PDV) et l'*Apple chlorotic leaf spot virus* (ACLSV), le *Plum pox virus* (PPV) et l'*Apple mosaic virus* (ApMV).

**Mots-clés:** Syrie, espèces fruitières à noyau, virus végétaux, ELISA.

## INTRODUCTION

The stone fruit industry is important in Syria, specially in the Southern and the Central part of the country. The total area cultivated with these crops is about 82,759 ha with annual production of nearly 257,000 tons. There are many important local cultivars for the domestic market of apricot, almond, plum and cherry, whereas the peach industry consists mainly of imported varieties.

Al Chaabi *et al.* (1997) were the first to report the sanitary conditions of stone fruits in Syria. However, to collect more information on stone fruit viruses, a survey was done, the results of which are briefly reported in this paper. However, a detailed description of this work is given in Ismaeil *et al.* (2003).

## MATERIALS AND METHODS

Field inspections and sample collections were carried out in seven Governorates (Damascus, Daraa, Al Swidaa, Homs, Hama, Edleb and Aleppo), representing the main stone fruits-growing areas of Syria. Samples were collected from: (i) private commercial orchards; (ii) varietal collections; and (iii) mother blocks for seed and budwood production belonging to the Ministry of Agriculture and Agrarian Reform. Dormant budwoods and leaf samples were collected randomly from 5 % of trees in commercial orchards and 20 % of trees in varietal collections and mother blocks (at least two trees from each variety). Surveys for symptom observation were done in spring.

All collected samples were tested by DAS-ELISA (Clark and Adams, 1977) for detection of ACLSV, and by DASI-ELISA (Cambra *et al.*, 1994) for PNRSV, PDV, ApMV and PPV.

## RESULTS AND DISCUSSION

In the course of field surveys, more than 12,000 trees were individually inspected in 55 commercial orchards, 4 varietal collections and 4 mother blocks. Most of the visited orchards were homogeneous in term of age, but most of them had more than one variety. Apricot orchards were generally old (over 20 years), whereas the other stone fruit plantings were 5 to 10 years of age.

Leaf symptoms were not frequent. However, in apricot, ACLSV was associated with chlorotic and yellow spots of the leaves. Mottling and pale yellow green areas in cherry leaves were associated with PDV. Asteroid spots and vein clearing were also seen in apricot, but could not be attributed to any of the viruses and viroids. Collected samples were in total 1,337: which represented 426 from commercial orchards, 507 from mother blocks and 404 from varietal collections. The commercial orchards were generally small and their selections representative of the fruit industry distribution in the country. A total of 68 peaches, 40 cherries, 30 almonds 26 apricots and 7 plums proved to be infected at least by one virus. The infection levels among different species were: peach 24%, cherry 16%, almond 13%, apricot 6% and plum 5%. The mean level of infection considering all tested samples was 13%, and there was no large difference between commercial orchards (10%) and mother blocks (8%).

Detected viruses included PPV, PDV, PNRSV, ACLSV and ApMV. Mixed infections of PDV+ACLSV, PNRSV+ApMV and PDV+PNRSV were also found. The prevailing viruses in the infected trees were: PNRSV (87% in almond and 73% in peach), PDV (87% in cherry and 46% in plum), ACLSV (54% in apricot). PPV and ApMV occurred as single tree infections.

## CONCLUSIONS

The present study shows that the sanitary status of the stone fruit industry in Syria is generally satisfactory considering that no sanitary selection and certification programs have been carried out and is comparable to that recorded from other neighbouring countries i.e. Jordan (Al Rwahnih *et al.*, 2001), Lebanon (Jawhar *et al.*, 1996), and Palestine (Jarrar *et al.*, 2001). PPV was reported earlier in Syria (Dunez, 1986), but it seems that the eradication of the infected trees carried out by local institutions was effective in controlling the disease.

Given the overall sanitary condition of the Syrian stone fruit industry, a national certification program would be highly desirable for limiting further spread of virus diseases in the country.

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