Viral Diseases of Yams in India

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Crop and importance

In India Yams are cultivated practically in all the states. Major yam producing states are, Andhra Pradesh, Assam, Bihar, Gujarat, Kerala, Maharashtra, Orissa and West Bengal.
- D. alata is the main species cultivated commercially followed by D. esculenta in some places.
- Consumption is relatively more in Orissa, West Bengal and Kerala.
- In India it is mostly peeled, boiled and consumed.

Indian scenario
Survey revealed:
- The incidence of mosaic in Thiruvananthapuram, Pathanamthitta, Kollam, and Alapuzha districts of Kerala.
- East Godavari and West Godavari districts of Andhra Pradesh.
- Khurda and Ganjam districts of Orissa.
- The incidence varies between 0 to 100% depending on the varieties.
Nearly ten different viruses have been reported to infect yams (Dioscorea) around the world.

Seven are important:
- Yam mosaic virus (YMV),
- Dioscorea alata potyvirus (DAV),
- Dioscorea alata badnavirus (DABV),
- Dioscorea alata ring mottle virus (DARMV),
- Dioscorea trifida virus (DTV),
- Dioscorea dumetorum virus (DDV)
- Chinese yam necrotic mosaic virus (CYNMV)

Information on presence of such viruses in India is scanty.
Dioscorea alata mosaic

Reduction in leaf size

Mosaic infection

Dioscorea alata mosaic and distortion
**Dioscorea rotundata**
Distortion and size reduction

**Dioscorea alata virus predominant**

**Dioscorea esculenta**
Distortion
Mosaic

YMV+ DAV in D. rotundata
YMV + DAV in D. alata


**DOTBLOT IMMUNOBINDING ASSAY** (with DAV antibody)

- 1, 3: *D. alata* leaves
- 2, 4, 9: *D. alata* tuber (+)
- 5, 7: Sree Keerthi leaves
- 6, 8: *N. benthamiana*

**D. alata(YMV) D. alata(DaBV)**

**DAS-ELISA**

*DAV - DNA purified and reamplified*
Sequencing of ~200 bp of DAV cDNA was done (Bangalore gene)
- Sequence blast in NCBI database
- 91% related to the sequence of YMMV or DAV reported earlier

CONCLUSION
- Virus diseases are common in all the yam growing areas of India
- Four different viruses have been identified through Serological and Nucleic acid based techniques
- Mixed infection is also found
- DAV was found all the three edible species, YMV in D. alata and D. rotundata and DABV only in D. alata
- Dioscorea alata virus (DAV) or Yam mild mosaic virus (YMMV) is severe at present
- Incidence varies between varieties

THANK YOU