Major viruses affecting food legumes in Morocco

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BACKGROUND

Food legumes play an important role in Morocco's agricultural landscape. They cover approximately 270,000 hectares, representing 4% of the total agricultural area. Faba bean (*Vicia faba* L.) contribute 35% to the national production of legumes, followed by kabuli chickpea (25%), lentil (17%), pea (13%), and 10% is covered by other legumes(MAPM, 2022). The productivity of food legumes has persistently remained low and variable, primarily attributed to the susceptibility of the crop to environmental stresses, diseases, insect pests, and parasitic weeds. Challenges such as inadequate seed multiplication systems, limited input usage, , labor cost and availability, and a low degree of mechanization further contribute to the existing constraints.

Field survey covering the main faba bean production areas in Morocco was conducted three decades ago (Fortass and Bos, 1991), and Luteoviruses (e.g. Bean leafroll virus, BLRV) and Broad bean mottle virus (BBMV) were found most prevalent viruses. Few important legume viruses have been reported in Morocco individually, such as Faba bean necrotic yellows virus (FBNYV) (El-Amri, 1999) and Chickpea chlorotic stunt virus (CpCSV) (Abraham *et al*., 2009). To set priorities for the development of new varieties and disease management, status and identification of viruses affecting legume crops is essential in the different production areas.

OBJECTIVE

Identify the major viruses affecting food legumes in Morocco.

METHODOLOGY

Surveys of food legume viruses were conducted during February and March 2023 in regions of Doukkala and Chaouia, Morocco. Fields of chickpea, faba bean and lentil were considered. Samples from 288 plants (Table 1) with symptoms suggestive of virus infection (yellowing, stunting, reddening, necrosis) were collected from 39 fields. Plant samples were blotted on nitrocellulose membrane (NCM) and sent to ICARDA's Virology Lab in Lebanon for testing.

Blotted NCMs were tested by Tissue blot immunoassay (TBIA) using seven specific virus antibodies: Chickpea chlorotic stunt virus (CpCSV), Beet western yellows virus (BWYV), Bean leafroll virus (BLRV), Faba bean necrotic yellows virus (FBNYV), Bean yellow mosaic virus (BYMV), Chickpea chlorotic dwarf virus (CpCDV) and Broad bean statin virus (BBSV).

RESULTS

Results showed that BLRV and BYMV were the most common viruses affecting lentil, faba bean and chickpea in the two surveyed provinces (Table 1). CpCSV was detected in chickpea and faba bean, whereas BWV was detected only in one faba bean sample, and FBNYV was detected in lentil and faba bean samples (Table 1). All tested samples did not react with CpCDV and BBSV antisera.

Table 1. Results of tissue blot immunoassay (TBIA) tests of legume crop samples with symptoms suggestive of virus infection from Morocco. Values in parenthesis represent percent (%) virus incidence based on the serological testing.

Region	Crop	No. of fields visited	No. of samples tested	Number of samples reacted positively to [a]				
				CpCSV	BWYV	BLRV	FBNYV	BYMV
Chaouia	Chickpea	10	64	4		1		1
	Faba bean	7	32	1	1	6		
	Lentil	7	67			7	1	
Doukkala	Faba bean	13	108	3		32	5	56
	Lentil	2	17			5		2
Total		**39**	**288**	**8**	**1**	**51**	**6**	**59**

* All tested samples were negative to BBSV and CpCDV.

CONCLUSIONS

- A total of 163 (56.6%) out of the 288 samples tested did not react with any of the specific antibodies used in this study. This indicates that there are other viruses can infect food legumes in Morocco, which need further characterization and using more specific virus antibodies.
- Since this year may present challenges due to drought conditions, we recommend conducting a second year of survey, adding new production areas and increasing the number of samples tested to obtain a clear picture of legume viruses in Morocco.

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