

Alternative Hosts of Yellow Dwarf Viruses (YDVs) and Sources of Resistance in Barley in Ethiopia

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Diseases are key biotic constraints facing barley production in many countries. One of the key diseases group is yellow dwarf viruses (YDVs). Alternative hosts play an important role in the epidemiology of YDVs. Studies were made in Ethiopia to identify potential alternative hosts and resistance sources in barley during the period from 2013–2016. Surveys for wild annual and perennial grass hosts were conducted in major cereals growing belts in central, southeast and northwest Ethiopia. Samples were collected following simple random sampling technique, and virus identifications were done by tissue blot immunoassay (TBIA) using virus specific polyclonal antibodies. For host plant resistance screening, around 1500 barley land races were screened for Barley yellow dwarf virus-PAV (BYDV-PAV) resistance under field and artificial inoculation in the greenhouse. Out of 13,604 grass samples tested, YDVs were detected from 392 (2.9%) samples, which consisted of various wild grasses and forage cereals. YDVs were identified from at least 26 grass species, and some of the alternative hosts identified were new records. A large number of alternative hosts reported for the first time in Ethiopia are *Andropogon abyssinicus* (Fresen.) R.Br. ex Fresen, *Avena abyssinica* Hochst., *Bromus pectinatus* Thunb., *Eragrostis tef* (Zucc.) Trotter, *Eragrostis* sp. (locally named ‘Muriye’), *Hyparrhenia anthistrioides* Stapf., *Panicum coloratum* L., *Polypogon monspeliensis* (L.) Desf., *Setaria pumila* (Poir.) Roem. & Schult., *Setaria australiensis* (Scribn. & Merrill) Vickery and *Snowdenia polystachya* (Fresen.) Pilg. Out of 165 elite barley genotypes selected and tested against Yd2-linked markers (Y1p-CAPS-MF & Y1p-CAPS-MR), 98 (59%) of the selected landraces confirmed to contain the Yd2 resistant gene. In conclusion, the role of alternative hosts can play a major role in initiating YDVs epidemics. Conversely, there are ample sources of resistance that can be deployed using markers assisted selection to combat YDVs.