## Thematic area 2. Host plant resistance

# Diverse Pistillate Lines as New Sources of Resistance to Fusarium Wilt in Castor

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**Abstract**

Castor (*Ricinus communis* L.) belongs to Euphorbiaceae family and is an important industrial oilseed crop. India, with 7.62 lakh ha area and 12.20 lakh tonnes production, contributes for 80% of the global castor production with highest productivity (1600 kg/ha) (2018-19, AICRP-castor annual report). Though castor genepool has limited natural variability due to its monotypic nature, there has been a significant genetic improvement through conventional breeding methods and induced mutations. *Fusarium* wilt (caused by *Fusarium oxysporum* f.sp. ricini) in castor causes 39-77% yield loss and is both soil as well as seed borne in nature. Castor hybrids with at least20% *Fusarium* wilt incidence are considered resistant and has been a bench mark for their release for cultivation in India and thereby it is essential to have wilt resistant parents for hybrid development. Castor lines with 20-40 % wilt incidence are considered as moderately resistant. Castor hybrids are derived from two line system of mating involving pistillate (female expression in cool temperatures of 20-300C) and male line. In this context, five diverse pistillate lines, *viz.,* DPC-22, IPC-41, IPC-42, IPC-43 and IPC-46, have been developed using eight diverse lines through recombination breeding and pedigree method of selection. These pistillate lines had stable pistillate expression at F7 generation and data on their agromorphological traits were recorded from five plants of the each stabilized line. Two pistillate lines, IPC-30 and IPC-31, were derived through selection and stabilization in the segregants of mutant pistillate line M-619, which was originally derived from VP-1 by subjecting it to Gamma rays. These lines were further screened for wilt reaction (resistant check 48-1 and susceptible check JI-35) in wilt sick plot at ICAR-IIOR during 2019-20 as per the standard procedure. Five pistillate lines viz., DPC-22, IPC-31, IPC-42, IPC-43 and IPC-46 recorded <20% wilt incidence while two pistillate lines, IPC-30 and IPC-41 recorded 25 % and 22.5 % wilt respectively. IPC-41, IPC-42 and IPC-43 were early flowering with node number ≤ 13. DPC-22 and IPC-46 had better test weight (≥ 37 grams for 100 seeds). DPC-22, IPC-30 and IPC-46 had long primary spikes (>65 cm). These diverse pistillate lines would serve as a potential source of wilt resistance, complementing their superior pistillate and agronomic traits, for development of high yielding hybrids and varieties in castor.