ABSTRACT

YULIA IRAWATI. Genetic Parameters Estimation of Pepper (Capsicum annuum L.) Resistance to Anthracnose (Colletotrichum acutatum) Using Diallel Analysis. Supervised by SRIANI SUJIPRIHATI and WIDODO.

Anthracnose (Colletotrichum acutatum) is considered of the major disease that may cause significant yield losses in pepper. Resistance variety is important for controlling disease infection since other methods were not effective. The aim of this research is to identify pepper genotype resistance and estimating genetic parameters of pepper resistance to anthracnose. This experiment were done in three steps: (1) screening of pepper resistance to anthracnose, (2) estimating genetic parameters of pepper resistance to anthracnose using diallel analysis and (3) determining the selection character using path analysis. The first experiment was conducted using 21 genotypes and C. acutatum isolate BKT 04. Mature green fruit were inoculated using microinjection method. The result showed that based on disease incidence, there was no genotype which resistance to anthracnose. However, there were three genotypes (IPB C15 x IPB C10, IPB C15 and IPB C8) which resistance based on lesion diameter. Set population from half diallel crosses which involve 6 parents and 15 crosses with C. acutatum isolate BKT 04 were used in the second experiment. Disease resistance percentage and lesion diameter were used for estimating genetic parameters and combining ability. Disease incidence and lesion diameter were used for estimating heterosis. The results show that there is no non allelic interaction, gene effects for resistance to anthracnose were additive and dominance, dominance effect larger than additive effect, the degree of dominance was overdominance, genes distribution in the parents was assymetrical, anthracnose resistance was controlled by one gene group, broad-sense heritability was high and narrow-sense heritability was low. General combining ability of IPB C15 was high for disease resistance percentage and lesion diameter, specific combining ability of IPB C15 x IPB C9 was high for disease resistance percentage and specific combining ability of IPB C15 x IPB C10 and IPB C4 x IPB C2 were high for lesion diameter. Negative heterosis was expected in disease resistance traits, IPB C15 x IPB C9 had negative heterosis for disease incidence and IPB C10 x IPB C9 had negative heterosis for lesion diameter. The thickness of fruit flesh is recomended for selection criteria for developing anthracnose resistant pepper varieties.

Keywords: anthracnose, pepper, diallel analysis, path analysis