

kekeringan. 4) Didapatkantigaaksesibungamataharitoleranterhadapkekeringan, yaitu: HA21, HA44, HA45.

Kata kunci: *Helianthus annuus* L., fisiogenetik, seleksi, cekamankekeringan

**Physiogeneticandselection
of sunflower(*Helianthus annuus* L.)tolerant
towarddroughtstress**

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ABSTRACT

The aim of this research was to study the physiogenetic response and to screen on drought tolerant sunflower plants. The research was divided in three part: (1).the response of sunflower plants and the identification of their tolerance toward drought stress, (2). evaluating the potential of local sunflower plants and selection toward drought stress., (3). The tolerance of sunflower plants under drought stress based on physiogenetic characteristic. The quantitative data were analyzed by Analysis of Variant (ANOVA), and if there were significant differences then further analysed by Honestly Significant Difference (HSD) test. The data of potential of local sunflowers were tested using t-test, followed by a selection based on its selection limit value. The PCR and sequencing result data were analyzed descriptively. The sequent result of each sample was traced and confirmed between the forward and reverse sequent results using the Sequence Scanner v.1 and Bioeditsoftwares. Furthermore, the data were aligned with the Clustal W program using the Bioedit software and Basic Local Alignment Search Tool (BLAST) program on the NCBI. The result of the research were: (1). The condition of drought stress less above 80% of Field Capacity (FC) can reduce plant growth, inhibit the blossoming, seed formation of sunflower and decrease oil content.(2). Thirty three sunflower accessions had various potentials and characters toward drought stress. Ten sunflower accessions were selected, namely: HA01, HA12, HA21, HA22, HA25, HA26, HA28, HA44, HA45, and HA50 that have the potential to be cultivated in Indonesia., (3). Each sunflower accession that was put under drought stress had different tolerance level. HA21, HA45, and HA44 were the accessions with drought stress tolerance supported by their full-bodied seed character. Plants that suffered drought stress underwent character changes on both their morphology and physiology, including plant height, size of leaves, stem diameter, root appearance, stomatal density, and feather of leaves. Their abilities in photosynthesis and transpiration were decreasing, except for their prolin and ABA level that increased highly significant. The tolerance mechanism per plant that was controlled by one of drought genes on sunflower, namely *HaDhn* gene which is 927 bp in size.The sequence result of the tolerant accession (HA21) differed from other moderate or sensitive accessions, but was similar to the consensus region for the gene character of drought resistance. It showed that each accession responded differently toward drought stress. (4). Three accessions, namely: HA21, HA44, and HA45, respectively, were drought tolerance sunflowers.

Key words: *Helianthus annuus* L., physiogenetic, selection, drought stress, drought tolerance