Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman
Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Acora, R., Irigoyen, J.J., Draz, M.S. 2001. Photosynthesic characteristic and protective mechanism againt oxidative stressduring chilling and subsequent recovery in two maize varieties differing in chilling sensitivity. *Plant Science* 161: 719-726

Afza, H. 2016. Peran konservasi dan karakterisasi plasma nutfahpadi beras merah dalam pemuliaan tanaman. *Jurnal Litbang Pertanian* 35(3): 143-153

Agarwal, M. K. and Zhu, J-K., 2005. *Integration of abiotic stress sugnaling pathways. In M. Jenks and M. Hasegawa (Eds). Plant abiotic stress.* Blackwell Publisher. pp. 215-237

Ahmad, P. 2014. *Oxidative damage to plants: antioxidant networks and signaling. Elsevier Science*, Academic Press, Amsterdam, p 672. ISBN 9780128004609.

Alscher, R.G., Erturk, N., Heath, L.S. 2002. Role of superoxide dismutases (SODs) in controlling oxidative stress in plants. *J Exp Bot* 53:1331–1341

Andoko, A. 2002. *Budidaya Padi Secara Organik*. Penebar Swadaya. Jakarta. pp 1-20.

Apel, K., and Hirt, H. 2004. Reactive oxygen species metabolism, oxydative stress, and signal transduction. *Plant Biol* 55:373-399.

Arora, A., Sairam, R. K., Srivastava, G. C. 2002. Oxidative stress and antioxidative system in plants. *Curr. Sci*. 82: 1221-1235.

Asada, K. 1992. Ascorbate peroxidase - A hydrogen peroxide-scavenging enzyme in plants. *Physiol Plantarum*. 85:235-241.

Asada, K. 1999. The water-water cycle in chloroplast: scavnging of active oxygene and disspartion off excess photons. *A. Rev Plant Physiol. Plant Mol, Biol* 50:601-639.

Asamarai, A. M., Addis, P. B., Epley, R. J., and Krick, T. P. 1996. Wild rice hull antioxidants. *J. Agric. Food Chem*. 44:126–130.

Badan Penelitian dan Pengembangan Departemen Pertanian. 2009. Morfologi dan Fisiologi Tanaman Padi. [25 Februari 2019]. *www.Litbag.deptan.go.id/special/padi/bbpadi_2009_itkp_11.pdf.*

UNIVERSITAS GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Badan Pusat Statistik (BPS). 2018. *Berita Resmi Statistik : Luas Panen dan Produksi Padi di Indonesia 2018*. Badan Pusat Statistik. p. 1-12

Bates, L. S. 1973. Rapid Determination of Free Prolin for Water-Stress Studies. *Plant Soil*. 39:205-207.

Bergmeyer, N. 1970. *Methoden der enzymatischen Analyse, vol. 1*. Akademie Verlag, Berlin, 636–647.

Berkowitz, G. A. 1998. Water and Salt Stress. In: Raghavendra AS (ed). *Photosyntesis: A Comprehensive Treatise*. Cambridge : Cambridge University Pr. p. 226-237.

Bhattacharjee, S. 2005. Reactive oxygen species and oxidative burst: Roles in stress, senescence and signal transduction in plants Currnt Scienc. *Current Science*. 89 (7).

Bhattacharjee, S. 2010. *Sites of generation and physicochemical basis of formation of reactive oxygen species in plant cell. In: GUPTA, S.D. Reactive oxygen species and antioxidants in higher plants*. Enfield: Science Publishers. p.1-30.

Bimpong, I. K., Serraj, R., Chim, J. H., Mendoza, E. M. T., Hernandez, J., Mendioro, M. S. 2011. Determination of genetic variability for physiological traits related to drought tolerance in African rice (*Oryza glaberrima*). *Journal of Plant Breeding and Crop Science*. 3(4): 60-67

Bindi, M., Bellesi, S., Orlandini, S., Fibbi, F., Moriondo, M., Sinclair, T. R. 2005. Influence of water defi cit stress on leaf area development and transpiration of Sangiovese grapevines grown in pots. American Journal of Enology and Viticulture 56: 68-72

Birben, E., Sahiner, U. M., Sackesen, C., Erzurum, S., Kalayci, O. 2011. Oxidative stress and antioxidant defense. *World Allergy Organ J*. 5(1): 9-19.

Bindi, M., Bellesi, S., Orlandini, S., Fibbi, F., Moriondo, M. Sinclair, T.R. 2005. Influence of water defi cit stress on leaf area development and transpiration of Sangiovese grapevines grown in pots. *American Journal of Enology and Viticulture* 56: 68-72.

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Bosch, M., and Alegre, L. 2002. The fuction of tocopherols and tocotrienols in plant. *Crit. Rev. Plant. Sci.* 21: 31-57.

Bouman, B. A. M., Lampayan, R. M., and Toung, T. P. 2007. *Water management in Irigated Rice: Coping Rith Water Scarcity*. Los Banos, Philipines: International Rice Research Institude.

Bray, E. A., Bailey-Serres, J., Weretilnyk, E. 2000. Responses to abiotic stresses. In: Gruissem W, Buchannan B, Jones R. *Biochemistry and Molecular Biology of Plants*. Maryland, USA: American Society of Plant Physiologists: 1158–1249.

Cabuslay, G. S., Ito, O., Alejal, A. A. 2002. Physiological evaluation of responses of rice (*Oryza sativa* L.) to water deficit. *Plant Sci*, 163(4): 815–827.

Centritto, M., Lauteri, M., Monteverdi, M. C., Serraj. R. 2009. Leaf gas exchange, carbon isotope discrimination, and grain yield in contrasting rice genotypes subjected to water deficits during the reproductive stage. *J Exp Bot*, 60(8): 2325–2339.

Chaudhary, R.C. 2003. Specialty rices of the world: Effect of WTO and IPR on its production trend and marketing. *J. Food Agric.Environ*. 1(2): 34–41.

Cha-um, S., Yooyongwech, S., Supaibulwatana, K. 2010. Water deficit stress in the reproductive stage of four indica rice (*Oryza sativa* L.) genotypes. *Pak J Bot*, 42(5): 3387–3398.

Chen, Q., Ling, W. H., Ma, J., and Mei, J. 2000. Effects of black and red rice on the formation of aortic plaques and blood lipids in rabbits. *J. Hyg. Res*. 29:170–172.

Chung, H. S. and Woo, W. S. 2001. A quinolone alkaloid with antioxidant activity from the aleurone layer of anthocyanin-pigmented rice. *J. Nat. Prod*. 64:1579–1580.

Dai, H. P., Zhang, P. P., Lu, C., Jia, G. L., Song, H., Ren, X. M., *et al*. 2011. Leaf senescence and reactive oxygen species metabolism of broomcorn millet (*Panicum miliaceum* L.) under drought condition. *Aust. J. Crop Sci*. 5, 1655–1660.

De Datta, S. K. 1981. *Principles and practices of rice production*. New York: John Willey and Sons. p. 618

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

De Guzman. 2012. Specific patterns of genetic diversity amongaromatic rice varieties in Myanmar. Khin Myo Myint et al. *Rice Journal* 5(20): 1–13.

De Pinto, M. C., Locato, V., Sgobba, A., Romero-Puertas, M. D. C., Gadaleta, C., Delledonne, M., de Gara, L. 2013. S-nitrosylation of ascorbate peroxidase is part of programmed cell death signaling in tobacco Bright Yellow-2 cells. *Plant Physiol*. 163. 1766–1775.

del Río, L. A. and Corpas F. J., Sandalio, L. M., Palma, J. M., Gomez, J. B., and Baroso, M. 2002. Reactive oxygen species, antioxidative system and nitric oxide in peroxisomes. *J Exp Bot*. 53: 1255-1272.

Faize M, Burgos L, Faize L. 2011. Involvement of cytosolic ascorbate peroxidase and Cu/Zn-superoxide dismutase for improved tolerance against drought. *Journal of Experimental Botany* 62: 2599–2613

Farooq, M. A., Saqib, F. A., and Akhtar, J. 2015. Silicon-mediated oxidative tolerance and genetic variability in rice (*Oryza sariva* L.) grown combined stress of salinity and boron toxicity. *Turk J Agric* For 39:1-12

Finocchiaro, F., Ferrari, B., and Gianinetti, A. 2010. A study of biodiversity of flavonoid content in the rice caryopsis evidencing simultaneous accumulation of anthocyanins and proanthocyanidins in a black-grained genotype. *J. Cereal Sci*. 51:28–34.

Foyer, C. H. and Noctor, G. 2003 Redox regulation in photosythetic organism signaling, acclimation, and practical implications, *Anti & Redox Signal* 4: 861-889

Foyer, C. H. and Noctor, G. 2005. Redox homeostasis and antioxidant signaling: A metabolic interface between stress perception and physiological responses. *Plant Cell.* 17:1866-1875.

Fridovich, I. 1995. Superoxide and superoxide dismutase. *Ann. Rev. Biochem*. 64:97-112

Fridovich, I. 1997. Superoxide anion radical ($O_2^{\bullet -}$), superoxide dismutases, and related matters. *J. Biol. Chem*. 272: 18515–18517. https://doi.org/ 10.1074/ jbc.272.30.18515

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Gana, A. S. 2011. Screening and resistance of traditional and improved cultivars of rice to drought stress at Badeggi, Niger State, Nigeria. *Agric Biol J North Am*, 2(6): 1027–1031.

Gholipoor, M., Sinclair, T. R., Prasad, P. V. V. 2012. Genotypic variation within sorghum for transpiration response to drying soil. *Plant Soil*. 357: 35-40.

Gill, S. S., and Tuteja, N. 2010. Reactive oxygen species and antioxidant machinery in abiotic stress tolerance in crop plants. Plant Physiol. Biochem. 48, 909–930. doi: 10.1016/j.plaphy.2010.08.016

Goffman, F. D. and Bergman, C. J. 2004. Rice kernel phenolic content and its relationship with antiradical efficiency. *J. Sci. Food Agric*. 84:1235–1240.

Grist, D. H. 1965. Rice. Fourth Edition. London : Longman Group Limited. p.548

Guo, Z., Ou, W., Lu, S., Zhong, Q. 2006. Differential response antioxidative systen to chilling and drough in for rice cultivars differeing in sensivity. *Plant Physiol Biochem*. 43: 828-836.

Ha, P. P. T. 2014. Physiological responses of rice seedlings under drought stress. *J Sci Devel.* 12(5): 635-640.

Hale, M.G., and Orcutt, D. M. 1987. *The Physiology of Plants under Stress*. New York : John Wiley and Sons. p. 604

Halliwel, l. B. 2006. Reactive species and antioxidants. Redox biology is a fundamental theme of aerobic life. *Plant physiology*, *141*(2), 312-22.

Hamim. 2004. Underlying drought stress effects on plants: inhibition of photosynthesis. *Hayati*. 11:164-169

Hanum. 2008. *Teknik Budidaya Tanaman Padi*. Direktorat Pembinaan Sekolah Menengah Kejuruan. Departemen Pendidikan Nasional. p. 330

He. H., Serraj, R., Yang, Q. 2009. Changes in OsXTH gene expression, ABA content, and peduncle elongation in rice subjected to drought at the reproductive phases of upland rice cultivars. *Sci. Agric*. 68: 24-30.

Hu, C., Zawistowski, J., Ling, W., Kitts, D. D. 2003. Black rice (*Oryza sativa* L. indica) pigmented fraction suppresses both reactive oxygen species and nitric oxide in chemical and biological model systems. *J. Agric. Food Chem*. 51:5271–5277

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Ichikawa, H., Ichiyanagi, T., Xu, B., Yoshii, Y., Nakajima, M., Konishi, T. 2001. Antioxidant activity of anthocyanin extract from purple black rice. *J. Med. Food* 4:211–218.

Jaleel, C. A., Manivannan, P., Wahid, A., Farooq, M., Somasundaram, R., and Panneerselvam, R. 2009. Drought stress in plants: a review on morphological characteristics and pigments composition. *Int. J. Agric. Biol.* 11:100-105.

Ji, K. X., Wang, Y. Y., Sun, W. N., Lou, Q. J., Mei, H. W., Shen, S. H., Chen, H. 2012. Drought-responsive mechanisms in rice genotypes with contrasting drought tolerance during reproductive stage. *J PlantPhysiol*, 169(4): 336–344.

Kennedy, G., Burlingame, B., Nguyen, N. 2002. Nutrient impact assessment of rice in major rice-consuming countries. *International Rice Commission Newsletter*. 51. 33-42.

Kumbhar, S. D., Kulwal, P. L., Patil, J. V., Sarawate, C. D., Gaikwad, A. P., Jadhav, A. S. 2015. Genetic diversity and population structure in landraces and improved rice varieties from India. *Rice Sci*, 22(3): 99–107

Kumar, A., Basu, S., Ramegowda, V., Pereira, A. 2017. *Mechanisms of drought tolerance in rice. Achieving sustainable cultivation of rice*. Vol. 1. University of Arkansas. p.131-163 10.19103/AS.2106.0003.08.

Kumar, S., Dwivedi, S. K., Singh, S. S., Bhatt, B. P., Mehta, P., Elanchezhian, R., Singh, V. P., Singh, O. N. 2014. Morphophysiological traits associated with reproductive stage drought olerance of rice (*Oryza sativa* L.) genotypes under rain-fed condition of eastern Indo-Gangetic Plain. *Ind J Plant Physiol*, 19(2): 87–93.

Lafitte, R. 2003. *Managing water for controlled droght in breeding plots*. *In K.S. Fischer R, S Lafitte, G Fukai, Atlin and B Hardy. Breeding Rice for Drought-Prone Environments*. International Rice Research Institute. Los Banos. p.23-26.

Lee, H. J., Oh, S. K., Choi, H. C., and Kim, S. U. 1988. Identification of anthocyanins from pigmented rice seed. *Agric. Chem. Bio. Technol*. 41: 257–262

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Lee, S. C., Kim, J. H., Jeong, S. M., Kim, D. R., Ha, J. U., Nam, K. C., and Ahn, D. U. 2003. Effect of far infrared radiation on the antioxidant activity of rice hulls. *J. Agric. Food Chem*. 51:4400–4403.

Li, C., Bai, T., Maa, F., Hana, M. 2008. Hypoxia tolerance and adaptation of anaerobic respiration to hypoxia stress in two Malus species. Sci *Hortic* 124:274–279

Ling, W. H., Cheng, Q. X., Ma, J., and Wang, T. 2001. Red or black rice decrease atherosclerotic plaque and increase antioxidant status in rabbits. *J. Nutr*. 131:1421–1426.

Ma, J., Chen, W. X., and Ling, W. H. 2000. The health efficacy of red rice and black rice. *J. Food Sci*. 21:139–140.

Maisura, Chozin, M. A., Lubis, I., Junaedinand, A., Ehara, H. 2014. Some physiological character responses of rice under drought conditions in a paddy system. *J Int Soc Southeast Asian Agric Sci*, 20(1): 104–114.

Manurung, S.D., dan Ismunadji, M. 1988. *Morfologi dan Fisiologi Padi*. Bogor. Pusat Penelitian dan Pengembangan Tanaman Pangan. p. 55-102.

Marklund, S., and Marklund, G. 1974. Involvement of the superoxide anion radical in the autoxidation of pyrogallol and convenient assay for superoxide dismuase. *Eur J Biochem*. 47 (3): 469-474.

Matsumoto, H., Nakamura, Y., Tachibanaki, S., Kawamura, S., and Hirayama, M. 2003. Stimulatory effect of cyanidin 3-glycosides on the regeneration of rhodopsin. *J. Agric. Food Chem*. 51:3560–3563.

Menezes-Benavente, L., Kernodle, S.P., Margis-Pinheiro, M., Scandalios, J.G. 2004) Salt-induced antioxidant metabolism defenses in maize (*Zea mays* L.) seedlings. *Redox Rep* 9:29–36.

Min, B., Chen, M. H., and Green, B. W. 2009. Antioxidant activities of purple rice bran extract and its effect on the quality of low-NaCl, phosphate free patties made from channel catfish (Ictalurus punctatus) belly flap meat. *J. Food Sci*. 74:268–277.

Miller G., Schlauch K., Tam R., Cortes D., Torres M. A., Shulaev V., et al. 2009. The plant NADPH oxidase RBOHD mediates rapid systemic signaling in

Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman
Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

response to diverse stimuli. *Sci. Signal*. 2:ra45 10.1126/ scisignal. 2000448.

Mittler, R., Vanderauwera, S., Gollery, M., Van Breusegem, F. 2004. The reactive oxygen gene network in plants. Trends Plant Sci 9: 490–498

Miller, G., Schlauch, K., Tam, R., Cortes, D., Torres, M.A., Shulaev, V., Dangl, J.L., Mittler, R. 2009. The plant NADPH oxidase RBOHD mediates rapid systemic signaling in response to diverse stimuli. *Sci Signal*. 2(84):ra45.

Mittler R., Vanderauwera S., Suzuki N., Miller G., Tognetti V.B., Vandepoele K., Gollery M., Shulaev V., Van Breusegem F. 2011. ROS signaling: The new wave? *Trends Plant Sci*. 16: 300–309

Miyazawa, M., Oshima, T., Koshio, K., Itsuzaki, Y., and Anzai, J. 2003. Tyrosinase inhibitor from black rice bran. *J. Agric. Food Chem*. 51:6953–6956.

Moldenhauer, K., C. E. Wilson, Jr., Counce, P., and Handrake, J. 2013. Rice Growth and Development. Arkansas Rice Production Hanbook. University of Arkansas. p. 9-20

Møller, I. M., Jensen, P. E., Hansson, A. 2007. Oxidative modifications to cellular components in plants. *Annu Rev Plant Biol* 58:459-81.

Morgan, J. M. 1984. Osmoregulation and Water Stress in Higher Plants. *Ann. Rev. Plant Physiol*. 35:299-319

Mulyani, A., dan Hidayat, A. 2009. Peningkatan kapasitas produksi tanaman pangan pada lahan kering. *Jurnal Sumberdaya Lahan*. 3(2): 73-84.

Munn-Bosch, S., and Alegre, L. 2002. The function of tocopherols in plants. *Crit. Rev. Plant Sci*. 21(1), 31–57.

Munné-Bosch, S., and Alegre, L. 2003. Drought-induced changes in the redox state of alpha-tocopherol, ascorbate, and the diterpene carnosic acid in chloroplasts of Labiatae species differing in carnosic acid contents. *Plant Physiol*. 131(4):1816-25.

Nakano, Y., and Asada, K. 1981. Hydrogen Peroxide is Scavenged by Ascorbate-specific Peroxidase in Spinach Chloroplasts. *Plant and Cell Physiology*. 22(5) : 867–880. https://doi.org/10.1093/oxfordjournals.pcp.a076232

UNIVERSITAS GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Nakornriab, M., Sriseadka, T., and Wongpornchai, S. 2008. Quantification of carotenoid and flavonoid components in brans of some Thai black rice cultivars using supercritical fluid extraction and high-performance liquid chromatography-mass spectrometry. *J. Food lipid* 15:488–503.

Nam, S. H., Choi, S. P., Kang, M. Y., Koh, H. J., Kozukue, N., and Friedman, M. 2006. Antioxidative activities of bran extracts from twenty one pigmented rice cultivars. *Food Chem*. 94:613–620.

Norsalis, E. 2011. Padi gogo dan sawah. Jurnal Online Agroekoteknologi 1(2).

Taiz, L., Zeiger, E. 2002. *Plant Physiology 3rd* Ed. Massachussetts : Sinauer Associaties Inc. Publisher. p. 690

Tananuwong, K., Tewaruth, W. 2010. Extraction and application of antioxidants from black glutinous rice. *LWT-Food Sci Technol* 43:471-481

Teixeira, F. K., Menezes-Benavente, L., Galvão, V. C., Margis, R., Margis-Pinheiro, M. 2006. Rice ascorbate peroxidase gene family encodes functionally diverse isoforms localized in different subcellular compartments. *Planta* 224(2):300-314

Teixeira, F. K., Menezes-Benavente, L., Margis, R., Margis-Pinheiro, M. Analysis of the molecular evolutionary history of the ascorbate peroxidase gene family: inferences from the rice genome. *J Mol Evol*. 59(6):761-770

Thitipramote, N., Pradmeeteekul, P., Pintathong, P., Nimkamnerd, J., Thitilerdecha, N. 2016. Bioactive compounds and antioxidant activities of red (Brown Red Jasmine) and black (Kam Leum Pua) native pigmented rice. *International Food Research Journal* 23(1): 410-414

Tian, S., Nakamura, K., and Kayahara, H. 2004. Analysis of phenolic compounds in white rice, brown rice, and germinated brown rice. *J. Agric. Food Chem.* 52:4808–4813.

Tjitrosoepomo, G. 2005. Taksonomi Tumbuhan Obat-obatan. Gadjah Mada University Press. Yogyakarta.

Pandey, V., and Shukla, A. 2015. Acclimation and tolerance strategies of rice under drought stress. Rice Sci. 22 147–161. 10.1016/j.rsci.2015.04.001

Parrado, J., Miramontes, E., Jover, M., M´arquez, J. C., Angeles-Mejias, M., Collantes-De, T. L., Absi, E., and Bautista, J. 2003. Prevention of brain

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

protein and lipid oxidation elicited by water-soluble oryzanol enzymatic extract derived fromrice bran. *Eur. J. Nutr*. 42:307–314.

Pelczar, M. J. dan Chan, E. C. S., 2005, "Dasar-dasar Mikrobiologi 1", Alih bahasa: Hadioetomo, R. S., Imas, T., Tjitrosomo, S.S. dan Angka, S. L. Universitas Indonesia Press, Jakarta.

Poedjiadi. 1994. *Dasar-dasar Biokimiawi*. Jakarta : Universitas Indonesia Press. 390-394.

Pham, J., and Desikan, R. 2009. *ROS Signalling in Stomata In: Reactive Oxygen Species in Plant Signaling*. Puppo A, del Rio L, Eds. Springer-Verlag pp.55-71.

Pritchard, S. D., Ju, Z., Saten, E.V., Qiu, J., Weaver, D. B., Prior, S. A., Roger, H. 2000. The influence of elevated CO2 on the activities of antioxidative enxymes in two soybean genotypes. *Aust J Plant Physiol* 27:1061-1068.

Reddy A. R., Chaitanya K.V., Vivekanandan, M. 2004. Drought-induced responses of photosynthesis and antioxidant metabolism in higher plants. *J. Plant Physiol*., 161: 1189-1202

Rhodes, C. J. 2011. Can free radicals be good for you?. *Sci Prog.* 94(4): 451-462.

Rosa, S. B., Caverzan, A., Teixeira, F. K., Lazzarotto, F., Silveira, J. A. G., Ferreira-Silva, S. L., Abreu-Netto, J., Margis, R., Margis-pinheiro, M. 2010, Cytosolic APX knockdown indicates an abigious redox responses in rice. Phytochem. 71:548-558.

Ryu, S. N., Park, S. Z., and Ho, C. T. 1998. High performance liquid chromatographic determination of anthocyanin pigments in some varieties of black rice. *J. Food Drug Anal.* 6:729–736.

Saseendran, S. S., Ahuja, L. R., Ma, L., Boote, K. J., Hoogenboom, G. 2008. Current water deficit stress simulations in selected agricultural system models. In: *Responseof Crops to Limited Water: Understanding and Modeling Water Stress Effects on Plant Growth Processes*., pp. 1–38.

Scandalios, J. G. 2002. The rise of ROS. *Trends Biochem Sci*. 27:483–486

Schiermeier, Q. 2008. Water: a long dry summer. *Nature*, 452: 270–273

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Sebastian, A. 2019. *Ekspresi Gen Kekeringan OsDREB1A dan OsNAC6 pada Padi Lokal Berpigmen di Indonesia*. Skripsi. Fakultas Biologi, Universitas Gadjah Mada. Yogyakarta. Halaman 34 – 38.

Selote, D. S., Bharti, S., Khanna-Chopra, R. 2004. Drought acclimation reduces $O_2^{\bullet -}$ accumulation and lipid peroxidation in wheat seedlings. *Biochem Biophys Res Commun*. 314 (3): 724-729.

Seki, M., Kamei, A., Yamaguchi-Shinozaki, K., Shinozaki, K. 2003. Molecular responses to drought, salinity and frost: Common and different paths for plant protection.*Curr Opin Biotechnol*, 14(2): 194–199.

Shao, H. B. Chu, L. Y., Shao, M. A., Jaleel, C. A., and Mi, H. M. 2008 Higher pant antioxidants and redox signaling under environmental stresses. *Comp Rend Biol*, 331: 433-441.

Shehab, G. G., Ahmed, O. K., El-Beltagi, H. S., 2010, Effects of various chemical agents for alleviation of drought stress in rice plants (*Oryza sativa* L.), *Not. Bot. Hort. Agrobot. Cluj* 38 (1): 139-148.

Shigeoka, S., Ishikawa. T., Tamoi. M., Miyagawa. Y., Takeda, T., Yabuta, Y., Yoshimura, K. 2002. Regulation and function of ascorbate peroxidase isoenzymes. Journal of Experimental Botany. 53(372): 1305-1319.

Silveira, J. A. G., Silv, S. L. F., Silva, E. N., Viegas, R. A. 2010. *Mecanismos biomoleculares envolvidos com a resistencia ao estresse salino em plantas. In: Ghey HR, da Dias NS, de Lacerda CF (eds) Manejo da salinidade na agricultura: Estudos basicos e aplicados 1st edn*. Expressa˜o Grafica e Editora, Fortaleza, p. 161–180.

Simmons, D. and Williams, R. 1997. Dietary practices among Europeans and different South Asian groups in coventry. *Br.J.Nutr*.78:5–14.

Sinclair, T. R., and Ludlow, M. M. 1986. Infl uence of soil water supply on the plant water balance of four tropical grain legumes. *Australian Journal Plant Physiology* 13: 319-340.

Singh, A., Sengar, K., Sengar, R. S. 2013. Gene regulation and biotechnology of drought tolerance in rice. *Int J Biotechnol Bioeng Res,**4**(*6): 547–552.

Siregar, H. 1981. Budidaya Tanaman Padi di Indonesia. Bogor : Sastra Budaya. p. 24-28.

UNIVERSITAS GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Smirnoff, N. 2000. Ascorbate biosynthesis and fuction in phoyoprotection. *Crit Rev. Plant Sci.*19: 267-290.

Smirnoff, N. 2007. *Antioxidants and Reactive Oxygen Species in Plants.* Oxford: Blackwell Publishing. 10.1002/9780470988565.

Sokoto, B. M., and Muhammad, A. 2014. Response of Rice Varieties to Water Stress in Sokoto, Sudan Savannah, Nigeria. *Journal of Biosciences and Medicines*. 02. 68-74. 10.4236/jbm.2014.21008.

Swain, P., Anumalla, M., Prusty, S., Marndi, B. C., and Rao, G. J. N. 2014. Characterization of some Indian native land race rice accessions for drought tolerance at seedling stage. *Aust J Crop Sci*. 8(3): 324-331.

Vegara, B. S. 1994. *A Farmer's Primer On Growing Rice, 2nd Ed*. The International Rice Institute. Los Banos Philiphine. p. 1-219

Violita. 2007. *Komparasi Respon Fisiologis Tanaman Kedelai yang Mendapat Cekaman Kekeringan dan Perlakuan Herbisida Paraquat* (tesis). Bogor : Program pascasarjana. Institiut Pertanian Bogor.

Wang, L., Xie, W., Chen, Y., Tang, W., Yang, J., Ye, R., Liu, L., Lin, Y., Xu, C., Xiao, J., Zhang, Q. 2005. A dynamic gene expression atlas covering the entire life cycle of rice. *Plant J*. 61(5): 752-66.

Wang, Q., Han, P., Zhang, M., Xia, M., Zhu, H. L., Ma, J., Hou, M. J., Tang, Z., and Ling, W. H. 2007. Supplementation of black rice pigment fraction improves antioxidant and anti-inflammatory status in patients with coronary heart disease. *Asia Pac. J. Clin. Nutr*. 16:295–301.

Wang, Y., Branicky, R., Noë, A., Heki, S. 2018. Superoxide dismutases: Dual roles in controlling ROS damage and regulating ROS signaling. Journal of Cell Biology. 217 (6): 1915-1923.

Wopereis, M. C. S., Krop, V. M. J., Maligaya, A.R., Tuong, A.R. 1996. Drought stress responses of two lowland rice Kultivars to soil water status. *Field CropsRes* 46:21-39.

Xu, F. and Wang, E. M. 1989. The effects of pigmented rice on hemoglobin regeneration in anemic rats. *Acta Nutr. Sin*. 11:120–125.

Yang, P. M., Huang, Q. C., Qin, G. Y., Zhao, S. P., Zhou, J. G. 2014. Different drought-stress responses in photosynthesis and reactive oxygen

UNIVERSITAS
GADJAH MADA
Respon Enzimatis pada Berbagai Kultivar Tanaman Padi Berpigmen (Oryza sativa L.)Terhadap Cekaman Kekeringan
ILHAM CAHYO NUGROHO, Dr. Yekti Asih Purwestri, M.Si.
Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

metabolism between autotetraploid and diploid rice. *Photosynthetica*, 52(2): 193–202.

Yoshida, S. 1981. *Fundamental of Rice Crop Science. International Rice Research Institute*. Los Banos, Philipine. p. 267

Yoshinaga, K. 1986. Liquor with pigments of red rice. *J. Brew. Soc. Jpn*. 81:337–342.

Zhu, F., Cai, Y. Z., Bao, J. S., and Corke, H. 2010. Effect of γ -irradiation on phenolic compounds in rice grain. *Food. Chem*. 120:74–77.