

DAFTAR PUSTAKA

- Adams, J.D. and Klaidman, L.K. 1993. Acrolein-Induced Oxygen Radical Formation. *Free Radical Biology and Medicine*, 15(2): 187-193.
- Afkhami-Ardakani, M., Hasanzadeh, S., Shahrooz, R., Delirez, N., and Malekinejad, H. 2018. Antioxidant Effects of *Spirulina platensis* (*Arthrospira platensis*) on Cyclophosphamide Induced Testicular Injury in Rats. *Veterinary Research Forum*, 9(1):35-41.
- Agarwal, A., Makker, K. and Sharma, K. 2008. Clinical Relevance of Oxidative Stress in Male factor Infertility: an Update, *Am. Journal of Reproductive Immunology*, 59(1):2-11.
- Agarwal, A., Virk, G., Ong, C., and du Plessis. 2014. Effect of Oxidative Stress on Male Reproduction. *World Journal of Men's Health*, 32(1): 1-17.
- Ahmadi, A., Hosseinimehr, S.J., Naghshvar, F., Hajir, E., and Ghahremani, M. 2008. Chemoprotective Effect of Hesperidin Against Genotoxicity Induced by Cyclophosphamide in Mice Bone Marrow Cells. *Archives of Pharmacal Research*, 31(6): 794-797.
- Aitken R.J., Whiting S., De Iuliis G.N., McClymont, S., Mitchell, L.A., and Baker, M.A. 2012. Electrophilic aldehydes generated by sperm metabolism activate mitochondrial reactive oxygen species generation and apoptosis by targeting succinate dehydrogenase. *Journal of Biological Chemistry*, 287:33048–33060.
- Akang, E., Oremosu, A., Dosumu, O., and Ejiwunmi, A. 2011. Telfairia occidentalis, a Prophylactic Medicine for Alcohol's Damaging Effect on the Testis. *Macedonian Journal of Medicinal Sciences*, 4(4): 380-387.
- AKCN, 2018. Kulit Biji Kopi Sebagai Antioksidan. <http://www.akacn.ac.id/artikel/kulit-bijikopi-sebagai-antioksidan>. Diakses tanggal 2 November 2020.
- Akomolafe, S.F. and Aluko, B.T. 2019. Protective Effect of Curcumin on Fertility in Cyclophosphamide Exposed Rats: Involvement of Multiple Pathways. *Journal of Food Biochemistry*, 44(1): 1-15.
- Al Balushi, H., Hannemann, A., Rees, D., Brewin, J., and Gibson, J.S. 2019. The Effect of Antioxidants on the Properties of Red Blood Cells From Patients With Sickle Cell Anemia. *Frontiers in Physiology*, 10: 976.
- Al Joudi. 2013. Adverse Effect of Excessive Antioxidant Supplements and Their Underlying Mechanisms. *Diabetes Research and Clinical Practice*, 2 (4): 339-345.
- Al Salih, H.A., Al-Sharafi, N.M., Al-Qabi, S.S., and Al-Darwesh, A.A. 2020. The Pathological Features of Cyclophosphamide Induced Multi-Organ Toxicity in Male Wistar Rats. *Systematic Reviews in Pharmacy*, 11(6): 45-49.

- Alkhalaf, M.I., Alansari, W.S., Alshubaily, F.A., Alnajeebi, A.M., Eskandrani, A.A., Tashkandi, M.A., and Babteen, N.A. 2020. Chemoprotective Effects of Inositol Hexaphosphate Against Cyclophosphamide-Induced Testicular Damage in Rats. *Scientific Reports*, 10(1): 12599.
- Altoe, P.M., Tatsuo, E.S., Paulo, D., and Jarske, R.D. Effects of Human Chorionic Gonadotropin on the Normal Testicular Tissue of Rats. *Acta cirurgica brasileira / Sociedade Brasileira para Desenvolvimento Pesquisa em Cirurgia*. Effects of human chorionic gonadotropin on the normal testicular tissue of rats. *Acta Cirúrgica Brasileira*, 29(5): 292-298.
- Amiri, A., Mohammadi, M., and Shabani, M. 2016. Synthesis and Toxicity Evaluation of Lead Oxide (PbO) Nanoparticles in Rats. *Electronic Journal of Biology*, 12: 2.
- Appasamy, M., Muttukrishna, S., Pizzey A., Ozturk, O., Groome, N., Serhal, P., and Jauniaux, E. 2007. Relationship Between Male Reproductive Hormones, Sperm DNA Damage and Markers of Oxidative Stress in Infertility. *Reproductive BioMedicine Online*, 14(2): 159-165.
- Armstrong, J.S., Rajasekaran, M., Chamulitrat, W., Gatti, P., Hellstrom, W.J., and Sikka, S.C. 1999. Characterization of Reactive Oxygen Species Induced Effects on Human Spermatozoa Movement and Energy Metabolism. *Free Radical Biology and Medicine*, 26: 869-880
- Arnold, W., Giroud, S., Valencak, T.G., and Ruf, T. 2015. Ecophysiology of Omega Fatty Acids: A Lid for Every Jar. *Physiology*, 30(3): 232-240.
- Ascencion, M., Ramirez-Coronel, Marnet, N., Kolli, V. S. K., Roussos, S., Guyot, S., and Augur, C. 2004. Characterization and Estimation of Proanthocyanidins and Other Phenolics in Coffee Pulp (*Coffea arabica*) by Thiolysis-High-Performance Liquid Chromatography. *Journal of Agricultural and Food Chemistry*, 52(5): 1344-1449.
- Aston, W.J., Hope, D.E., Nowak, A.K., Robinson, B.W., Lake, R.A., and Lesterhuis, W.J. 2017. A Systematic Investigation of The Maximum Tolerated Dose of Cytotoxic Chemotherapy with and without Supportive Care in Mice. *BMC Cancer*, 17: 628.
- Austin P.J., Suchar L.A., Robbins, C.T., and Hagerman, A.E. 1989. Tannin-Binding Proteins in Saliva of Deer and their Absence in Saliva of Sheep and Cattle. *Journal of Chemical Ecology*, 15:1335-1347.
- Ayala, A., Munoz, M.F. and Arguelles, S. 2014. Lipid Peroxidation: Production, Metabolism, and Signaling Mechanisms of Malondialdehyde and 4-Hydroxy-2-Nonenal. *Oxidative Medicine and Cellular Longevity*, 2014(6): 1-31.
- Ayhamci, A., Yaman, S., Appak, S., and Gunes, S. 2009. Hematoprotective Effect of Seleno-L-Methionine on Cyclophosphamide Toxicity in Rats. *Drug and Chemical Toxicology*, 32(4): 424-428.

- Ayhanci, A., Tanriverdi, D.T., Sahinturk, V., Cengiz, M., Appak-Baskoy, S., and Sahin, L.K. 2020. Protective Effect of Boron on Cyclophosphamide-induced Bladder Damage and Oxidative Stress in Rats. *Biological Trace Element Research*, 197(1): 184-191.
- Bait, Y. 2010. The Effectiveness of Giving Green Tea (*Camelia sinensis* Var Assamica). Mulbei Leaf Tea (*Morus kanva*) and the Mix in Hypoglycemic Activity on Mice (*Ratus novergicus*). Bogor Agricultural Institution.
- Bakhtiary, Z., Shahrooz, R., Ahmadi, A., and Zarei, L. 2014. Evaluation of Antioxidant Effects of Crocin on Sperm Quality in Cyclophosphamide Treated Adult Mice. *Veterinary Research Forum*, 5(3): 213-218.
- Bakker, R.R.C. 2013. *Availability of Lignocellulosic Feedstocks for Lactic Acid Production*. Food & Biobased Research Wageningen UR, Report 139.
- Bandar, H., Hijazi, A., Rammal, H., Hachem, Ali., Saad, Z., and Badran, B. 2013. Techniques for The Extraction of Bioactive Compounds from Lebanese *Urtica dioica*. *Environnement and Health*.
- Bansal, A.K. and Bilaspuri, G.S. 2010. Impacts of Oxidative Stress and Antioxidants on Semen Functions. *Veterinary Medicine International*, 686137.
- Barati, E., Nikzad, H., and Karimian, M. 2019. Oxidative stress and male infertility: current knowledge of pathophysiology and role of antioxidant therapy in disease management. *Cellular and Molecular Life Sciences*, 77(1): 93-113.
- Berecha, G., Lemessa, F. and Wakjira, M. 2011. Exploring The Suitability of Coffee Pulp Compost as Growth Media Substitute in Greenhouse Production. *International Journal of Agricultural Research*, 6(3):255-267.
- Bolisetty, S. and Jaimes, E.A. 2013. Mitochondria and Reactive Oxygen Species: Physiology and Pathophysiology. *International Journal of Molecular Science*, 14(3): 6306-6344.
- Bridges, D. 2017. Weight Loss Effects of Methotrexate and Cyclophosphamide. *Oncotarget*, 8(3):5640.
- Bulotta, S., Celano, M., Lepore, S.M., Montalcini, T., Pujia, A., and Russo, D. 2014. Beneficial Effects of the Olive Oil Phenolic Components Oleuropein and Hydroxytyrosol: Focus on Protection Against Cardiovascular and Metabolic Diseases. *Journal of Translational Medicine*, 12: 219.
- Buonocore, G., Perrone, S. and Tataranno, M.L. 2010. Oxygen Toxicity: Chemistry and Biology of Reactive Oxygen Species. *Seminars in Fetal and Neonatal Medicine*, 15(4): 186-190.
- Campbell, N.A. and Reece, J.B. 2010. *Biologi Jilid 3 Edisi ke 8*. Jakarta: Erlangga.
- Cano-Marquina A., Tarín J.J., and Cano A. 2013. The Impact of Coffee on Health. *Maturitas*, 75: 7-21.

- Cao, G., Sofic, E., and Prior, R.L. 1997. Antioxidant and Prooxidant Behavior of Flavonoids: Structure-Activity Relationships. *Free Radical Biology and Medicine*, 22(5): 749-760.
- Cavallasca, J.A., Costa, C.A., Maliandi, M.D.R., Contini, L.E., de Carrera, E.F., and Musuruana, J.L. 2015. Severe Infections in Patients with Autoimmune Diseases Treated with Cyclophosphamide. *Reumatología Clínica*, 11(4): 221-223.
- Ceribasi, A.O., Turk, G., Sonmez, M., Sakin, F., and Atessahin A. 2010. Toxic Effect of Cyclophosphamide On Sperm Morphology Testicular Histology And Blood Oxidant-Antioxidant Balance And Protective Roles Of Lycopene And Ellagic Acid. *Basic & Clinical Pharmacology & Toxicology*, 107:730-736.
- Cheng, C.Y. and Mruk, D.D. 2010. The Biology of Spermatogenesis: The Past, Present and Future. *Philosophical Transactions of The Royal Society: Biological Science*, 363(1546): 1459-1463.
- Chhipa, R.R., Singh, S., Surve, S.V., Vijayakumar, M., and Bhat, M.K. 2005. Doxycycline Potentiates Antitumor Effect of Cyclophosphamide in Mice. *Toxicology and Applied Pharmacology*, 202(3): 268-277.
- Chobot, V. and Hadacek, F. 2010. Iron and Its Complexation by Phenolic Cellular Metabolites. *Plant Signaling and Behavior*, 5(1):4-8.
- Codrington, A.M., Hales, B. F., and Robaire, B. 2007. Chronic Cyclophosphamide Exposure Alters The Profile of Rat Sperm Nuclear Matrix Proteins. *Biology of Reproduction*, 77(2): 303-311.
- Colli, L.G., Belardin, L.B., Echem, C., Akamine, E.H., Antoniassi, M.P., Andretta, R.R., Mathias, L.S., de Paula Rodrigues, S.F., Bertolla, R.P., and de Carvalho, M.H.C. 2019. Systemic Arterial Hypertension Leads to Decreased Semen Quality and Alterations in The Testicular Microcirculation in Rats. *Scientific Reports*, 9(1).
- Collodel, G., Moretti, E., Noto, D., Iacoponi, F., and Signorini C. 2020. Fatty Acid Profile and Metabolism are Related to Human Sperm Parameters and are Relevant in Idiopathic Infertility and Varicocele. *Mediators of Inflammation*, 2020: 3640450.
- Colvin, O.M. 1999. An Overview of Cyclophosphamide Development and Clinical Applications. *Current Pharmaceutical Design*, 5 (8): 555-560.
- Conklin, K.A. 2004. Chemotherapy-Associated Oxidative Stress: Impact on Chemotherapeutic Effectiveness. *Integrative Cancer Therapies*, 3(4): 294-300.
- Dan, D., Fischer, R., Adler, S., Forger, F., and Villiger, P.M. 2014. Cyclophosphamide: As Bad as Its Reputation? Long-term Single Centre Experience of Cyclophosphamide Side Effects in the Treatment of Systemic Autoimmune Diseases. *Swiss Medical Weekly*, 144.
- Darbandi, M., Darbandi, S., Agarwal, A., Sengupta, P., Durairajanayagam, D., Henkel, R., and Sadeghi, M.R. 2018. Reactive Oxygen Species And Male Reproductive Hormones. *Reproductive Biology and Endocrinology*, 16: 87.

- Darbandi, S. and Darbandi, M. Lifestyle Modifications on Further Reproductive Problems. 2016. *Cresco Journal of Reproductive Science*, 1: 1-2.
- Davis, A.P., Govaerts, R., Bridson, D.M., and Stoffelen, P. 2006. An Annotated Taxonomic Conspectus of the Genus *Coffea* (Rubiaceae). *The Botanical Journal of the Linnean Society*, 152: 465-512.
- de Haas, E.C., Oosting, S.F., Lefrandt, J.D., Wolffenbuttel, B.H., Sleijfer, D.T., and Gietema, J.A. 2010. The Metabolic Syndrome in Cancer Survivors. *The Lancet Oncology*, 11(2): 193-203.
- Delimont, N.M., Haub, M.D., and Lindshield, B.L. 2017. The Impact of Tannin Consumption on Iron Bioavailability and Status: A Narrative Review. *Current Developments in Nutrition*, 1(2): 1-12.
- Dianzani M. and Barrera G. 2008. Pathology and Physiology of Lipid Peroxidation and its Carbonyl Products. In: Álvarez, S.; Evelson, P. (Ed.), *Free Radical Pathophysiology*, 1938. Transworld Research Network: Kerala, India, 978-8-17895-311-3.
- Diartha, I, W, W., Sudatri, N, W., and Setyawati, I. 2016. Pengaruh Pemberian Ekstrak Tauge Ditambah Madu Terhadap Kualitas Spermatozoa Mencit Jantan (*Mus musculus* L.). *Jurnal Simbiosis IV*, 4(1): 1-5.
- Dimitrios, B. 2006. Sources of Natural Phenolic Antioxidants. *Trends in Food Science and Technology*, 17(9): 505-512.
- Dkhil, M.A., Abdel Moneim, A.E., Bauomy, A.A., Khalil, M., Al-Shaebi, E.M., and Al-Quraishy, S. 2020. Chlorogenic Acid Prevents Hepatotoxicity in Arsenic-Treated Mice: Role of Oxidative Stress and Apoptosis. *Molecular Biology Reports*, 47(2): 1161-1171.
- Donald, S.P., Sun, X.Y., Hu, C.A., Yu, J., Mei, J.M., Valle, D., and Phang J.M. 2001. Proline Oxidase, Encoded by p53-induced gene-6, Catalyzes the Generation of Proline-Dependent Reactive Oxygen Species. *Cancer Research*, 61: 1810-1815.
- Dorostghoal, M., Seyyednejad, S. M., and Nejad, M. N. T. 2019. Beneficial Effects of *Cichorium intybus* L. Extract on Oxidative Status and Reproductive Parameters in Male Wistar Rats: An Experimental Study. *International Journal of Reproductive Biomedicine*, 17(6): 425-434.
- Drane, P., Bravard, A., Bouvard, V., and May E. 2001. Reciprocal Down-Regulation of p53 and SOD2 Gene Expression-Implication in p53 Mediated Apoptosis. *Oncogene*, 20: 430-439.
- Drew, B. and Leeuwenburgh, C. 2002. Aging and the Role of Reactive Nitrogen Species. *Annals of the New York Academy Science*, 959(1): 66-81.
- du Plessis S.S., McAllister, D.A., Luu, A., Savia, J., Agarwal, A., and Lampiao F. 2000. Effects of H₂O₂ Exposure on Human Sperm Motility Parameters, Reactive Oxygen Species Levels and Nitric Oxide Levels. *Andrologia*, 42: 206-210.

- Duru, N.K., Morshedi, M., and Oehninger, S. 2000. Effects of Hydrogen Peroxide on DNA and Plasma Membrane Integrity of Human Spermatozoa. *Fertility and Sterility*, 74(6): 1200-1207.
- Earnest, E.O. and Ajaghaku, D.L. 2014. Guidelines on Dosage Calculation and Stock Solution Preparation in Experimental Animals' Studies. *Journal of Natural Science Research*, 4(18).
- Elangovan, N., Chiou, T., Tzeng, W., and Chu, S. 2006. Cyclophosphamide Treatment Causes Impairment of Sperm and its Fertilizing Ability in Mice. *Toxicology*, 222(1-2): 60-70.
- Elangovan, N., Chiou, T.J., Tzeng, W.F., and Chu, S.T. 2006. Cyclophosphamide Treatment Causes Impairment of Sperm and its Fertilizing Ability in Mice. *Toxicology*, 222 (2006): 60-70.
- Elgazar, A. F. 2016. Protective Role of Walnut Seeds Extract and Vitamin E Against Testicular Toxicity Induced by Cyclophosphamide in Male Rats. *British Journal of Medicine and Medical Research*, 18 (10): 1-10.
- Elkirdasy, A., Shousha, S., Alrohaimi, A.H., and Arshad, M.F. 2015. Hematological and Immunobiochemical Study of Green Tea and Ginger Extracts in Experimentally Induced Diabetic Rabbits. *Acta Poloniae Pharmaceutica ñ Drug Research*, 72(3): 497-506.
- El-Naggar, S. A., Alm-Aldeen, A., Germoush, M. O., El-Boray, K. F., and Elgebaly, H. A. 2014. Ameliorative Effect of Propolis Against Cyclophosphamide-Induced Toxicity in Mice. *Pharmaceutical Biology*, 53(2): 235-241.
- Emmanuel, A., Majesty, D., Benjamin, A., Peter, A., and Princess, U. 2017. Effect of Caffeine on Some Selected Biochemical Parameters Using Rat Model, *Advances in Biology*.
- Esquivel, P. and Victor M. Jimenez. 2011. Functional Properties of Coffe by-products. *Food Research International*, 46, 488-495.
- Eva, B.P., Nikolett, S., Tamas, K., Rita, C., Viktoria, L., Balasz., Tibor, S., Nemeth., and Nora, P. 2016. Antioxidant Potential, Tannin and Polyphenol Contents of Seed and Pericarp of Three *Coffea* Species. *Asian Pacific Journal of Tropical Medicine*, 9(4):366-371.
- Evans, E.P.P., Scholten, J.T.M., Mzyk, A., Reyes-San-Martin, C., Llumbet, A.E., Hamoh, T., Arts, E.G.J.M., Schirhagl, R., and Cantineau, A.E.P. 2021. Male Subfertility and Oxidative Stress. *Redox Biology*, 46: 102071.
- Faraonio, R., Vergara, P., Di, Marzo D., Pierantoni, M.G., Napolitano, M., Russo, T., and Cimino, F., 2006. p53 Suppresses the Nrf2-Dependent Transcription of Antioxidant Response Genes. *Journal of Biological Chemistry*, 281: 39776–39784.
- Felth, J. 2011. *Studies of Cytotoxic Compounds of Natural Origin and Their Mechanism of Action*. Sweden: Uppsala University.

- Feng, L., Huang, Q., Huang, Z., Li, H., Qi, X., Wang, Y., Liu, Z., Liu, X., and Lu, L. 2016. Optimized Animal Model of Cyclophosphamide-induced Bone Marrow Suppression. *Basic & Clinical Pharmacology & Toxicology*, 119: 428-435.
- Ferdousi, F., Araki, R., Hashimoto, K., and Isoda, H. 2019. Olive Leaf Tea May Have Hematological Health Benefit Over Green Tea. *Clinical Nutrition*, 38(6):2952-2955.
- Fibach, E. and Rachmilewitz, E. 2008. The Role of Oxidative Stress in Hemolytic Anemia. *Current Molecular Medicine*, 8: 609-619.
- Finkel, T. 2003. Oxidant Signals and Oxidative Stress. *Current Opinion in Cell Biology*, 15: 247-254.
- Franca, A.S. and Oliveira, L.S. 2016. *Coffee: Production, Consumption and Health Benefits*. New York: Nova Science Publishers.
- Fuentes, E., Araya-Maturana R., and Urrea F.A. 2019. Regulation of Mitochondrial Function as a Promising Target in Platelet Activation-Related Diseases. *Free Radical Biology and Medicine*, 136: 172-182.
- Fuentes, E., Caballero, J., Alarcon, M., Rojas, A., and Palomo, I. 2014. Chlorogenic Acid Inhibits Human Platelet Activation and Thrombus Formation. *PLoS One*. 9(3): e90699.
- Fujioka, K. and Shibamoto, T. 2008. Chlorogenic Acid and Caffeine Contents in Various Commercial Brewed Coffees. *Food Chemistry*, 106(1): 217-221.
- Gaucher, J., Reynoird, N., Montellier, E., Boussoir, F., Rousseaux, S., and Khochbin, S. 2010. From Meiosis to Postmeiotic Events: The Secrets of Histone Disappearance. *FEBS Journal*, 277: 599-604.
- Ghosh, A., Rabbani, S. I., Asdaq, S. M. B., Mohzari, Y., Alrashed, A., Alajami, H. N., Aljohani, A. O., Al Mushtawi, A. A., Alenazy, M. S., Alamer, R. F., and Alanazi, A. K. 2021. *Morus alba* Prevented the Cyclophosphamide Induced Somatic and Germinal Cell Damage in Male Rats by Ameliorating the Antioxidant Enzyme Levels. *Molecules*, 26: 1266.
- Gill, S. S. and Tuteja, N. 2010. Reactive Oxygen Species and Antioxidant Machinery in Abiotic Stress Tolerance in Crop Plants. *Plant Physiol Biochem*. 48(12): 909-930.
- Globocan, 2018. The Global Cancer Observatory. *World Health Organ*, 64: 1-31.
- Goetz, S.C. and Anderson, K.V. 2010. The Primary Cilium: A Signalling Centre During Vertebrate Development. *Nature Reviews Genetics*, 11: 331-344.
- Goldstein, M., and Schlegel, P. 2013. *Surgical and Medical Management of Male Infertility*. Cambridge: Cambridge University Press.
- Gosh, D., Das, U.B., Ghosh, S., Mallick, M., and Debnath, J. 2002. Testicular Gametogenic and Steroidogenesis Activities in Cyclophosphamide Treated Rat: A Correlative Study With Testicular Oxidative Stress. *Drug and Chemical Toxicology*, 25 (3):281-292.

- Goth, L. Rass, P. and Pay, A. Catalase Enzyme Mutations and Their Association with Disease. *Molecular Diagnosis*, 8(3): 141-149.
- Gough, D. R. and Cotter, T. G. 2011. Hydrogen Peroxide: A Jekyll and Hyde Signalling Molecule. *Cell Death and Disease*, 2(10): 213-213.
- Gual-Frau, J., Abad, C., Amengual, M.J., Hannaoui, N., Checa, M.A., and Ribas-Maynou J. 2014. Oral Antioxidant Treatment Partly Improves Integrity of Human Sperm DNA in Infertile Grade I Varicocele Patients. *Human Fertility (Cambridge, England)*. 18: 225-229
- Gunawan, P.P., Turalaki, G.L.A., and Teudean, L.E.N. 2017. Pengaruh Pemberian Pasta Tomat (*Solanum Lycopersicum*) terhadap Kualitas Spermatozoa Tikus Wistar (*Rattus Norvegicus*) Yang Terpapar Asap Rokok. *Jurnal e-Biomedik*, 5(2).
- Guyton, A and Hall J. 2014. *Medical Physiology Textbooks*. Jakarta: EGC.
- Hai, D.M., Ren, J.W., Chi, Y.N., Ye, R.J., Liu, N., Ma, L., Lan, X.B., Wu, J., Yu, J.Q., and Yang, J.M. 2021. Protective Effects of Sesamin on Cytoxin-Induced Spermatogenesis Dysfunction by Regulating RNF8-ubH2A/ubH2B Pathways in Male Mice. *Frontiers in Pharmacology*, 12: 708467.
- Halliwell, B., Clement, M.V., and Long, L.H. 2000. Hydrogen Peroxide in the Human Body. *FEBS Letters*, 486(1): 10-13.
- Hamidu, A.A. 2012. Phytochemical Constituents of the Leaves of *Sterculia setigera*. *Journal of Pharmaceutical Sciences*, 2(1): 62-64.
- Hanukoglu, I. 2006. Antioxidant Protective Mechanisms Against Reactive Oxygen Species (ROS) Generated by Mitochondrial P450 Systems in Steroidogenic Cells. *Drug Metabolism Reviews*, 38(12): 171-196.
- Harun, H., Daud, A., Hadju, V., Arief, C. P. P., Talebe, T., Rahma., Wahyuni, R. D., Sumarni., Miranti., Amri, I., Faris, A., and Mallongi, A. 2020. Antioxidant Effect of *Moringa oleifera* Leaves in Hemoglobin Oxidation Compare with Vitamin C. *Enfermería Clínica*, 30(S4): 18-21.
- Hasanuzzaman, M., Bhuyan, M., Anee, T. I., Parvin, K., Nahar, K., Mahmud, J. A., and Fujita, M. 2019. Regulation of Ascorbate-glutathione Pathway in Mitigating Oxidative Damage in Plants under Abiotic Stress. *Antioxidants*, 8(9): 384.
- He, Z., Ma W.Y., Hashimoto, T., Bode, A.M., Yang, C.S., and Dong Z. 2003. Induction of Apoptosis by Caffeine is Mediated by the p53, Bax, and Caspase 3 Pathways. *Cancer Research Journal*, 63: 4396-4401.
- Heeger, A., Kosińska-Cagnazzo, A., Cantergiani, E., and Andlauer, W. 2017. Bioactives of Coffee Cherry Pulp and Its Utilisation for Production of Cascara Beverage. *Food Chemistry*, 221: 969-975.
- Higdon, J. and Frei, B. 2006. Coffee and Health: A Review of Recent Human Research. *Critical Reviews in Food Science and Nutrition*, 46: 101-123.

- Higuchi, H., Nakaoka, M., Kawamura, S., Kamita, Y., Kohda, A., and Seki, T. 2001. Application of Computer-Assisted Sperm Analysis System to Elucidate Lack of Effects of Cyclophosphamide on Rat Epididymal Sperm Motion. *The Journal of Toxicological Sciences*, 26(2): 75-83.
- Hiwot, H. 2011. *Growth and Physiological Response of Two Coffea Arabica L. Population Under High and Low Irradiance*. Thesis: Addis Ababa University.
- Holinstat, M. 2017. Normal Platelet Function. *Cancer and Metastasis Reviews*, 36(2): 195-198.
- Hoong, Y.B., Paridah, M.T., Luqman, C.A., Koh, M.P., and Loh, Y.F. 2009. Fortification of Sulfited Tannin From the Bark of *Acacia mangium* with Phenol-Formaldehyde for use as Plywood Adhesive. *Industrial Crops and Products*, 1(30): 416-421.
- Hosseini, A., Shahrani, M., Asgharian S., Anjomshoa, M., Rostamzadeh, A., Lorigooini, Z., Asgharzadeh, N., and Azari, A. 2021. Ameliorative Effect of *Allium atroviolaceum* on Sperm Quality in Cyclophosphamide-Treated Mice. *Future Journal of Pharmaceutical Science*, 7(1): 1-11.
- Hosseini, A., Zare, S., Borzouei, Z., and Pakdel, F. G. 2018. Cyclophosphamide-Induced Testicular Toxicity ameliorate by American Ginseng Treatment: An Experimental Study. *International Journal of Reproductive BioMedicine*, 16(11): 711-718.
- Hou, F.X., Yang, H.F., Yu, T., and Chen, W. 2007. The Immunosuppressive Effects of 10 mg/kg Cyclophosphamide in Wistar Rats. *Environmental Toxicology and Pharmacology*. 30-36.
- Hsieh, Y.Y., Chang, C., and Lin, C.S. 2006. Seminal Malondialdehyde Concentration But Not Glutathione Peroxidase Activity is Negatively Correlated with Seminal Concentration and Motility. *International Journal of Biological Sciences*, 2(1): 23.
- Huang, Y., and Li, L. 2013. DNA Crosslinking Damage and Cancer – A Tale of Friend and Foe. *Translational Cancer Research*, 2: 144-154.
- Huhtaniemi, I. 2015. A Short Evolutionary History of FSH-Stimulated Spermatogenesis. *Hormones*, 14(4):468-478.
- Hussain, A., Shadma, W., Maksood, A., and Ansari, S.H. 2013. Protective Effects of *Picrorhiza kurroa* on Cyclophosphamide-Induced Immunosuppression in Mice. *Pharmacognosy Research*, 5(1): 30-35.
- Ighodaro, O.M. and Akinloye, O.A. 2017. First Line Defence Antioxidants-Superoxide Dismutase (SOD), Catalase (CAT) and Glutathione Peroxidase (GPX): Their Fundamental Role in The Entire Antioxidant Defence Grid. *Alexandria Journal of Medicine*, 54(4): 287-293.
- Ilbey, Y.O., Ozbek, E., Simsek, A., Otunctemur, A., Cekmen, M., and Somay, A. 2009. Potential Chemoprotective Effect of Melatonin in Cyclophosphamide and Cisplatin-Induced Testicular Damage in Rats. *Fertility and Sterility*, 92(3):1124-32.

- Iriondo-DeHond, A., Haza, A.I., Ávalos, A., del Castillo, M.D., and Morales, P. 2017. Validation of Co-Ee Silverskin Extract as a Food Ingredient by the Analysis of Cytotoxicity and Genotoxicity. *Food Research International*, 100: 791-797.
- Iuliano L., Colavita A.R., Leo R., Praticò M., and Violi F. 1997. Oxygen Free Radicals and Platelet Activation. *Free Radical Biology and Medicine*, 22: 999-1006.
- Jan, S.Z., Hamer, G., Repping, S., de Rooij, D.G., van Pelt, A.M.M., and Vormer, T.L. 2012. Molecular Control of Rodent Spermatogenesis. *Biochimica et Biophysica Acta*. 1822 (2012): 1838-1850.
- Jewell, T. 2018. Testes Overview. <https://www.healthline.com/human-body-maps/testis>. Diakses tanggal 28 Oktober 2020.
- Jung, A.J., Mee, J.J., Ji, Y.K., Hae, Y.C., and Jae, S.C. 2003. Inhibitory Activity of Flavonoids From *Prunus Davidiana* and Other Flavonoids on Total ROS and Hydroxyl Radical Generation. *Archives of Pharmacal Research*, 26(10): 809-815.
- Junqueira. 2016. *Basic Histology 14 Edition*. Indiana: University School of Medicine Bloomington.
- Karuppanapandian, T., Moon, J. C., Kim, C., Manoharan, K., and Kim, W. 2011. Reactive Oxygen Species in Plants: Their Generation, Signal Transduction, and Scavenging Mechanism. *Australian Journal of Crop Science*, 5(6): 709-725.
- Kattappagari, K.K., Teja, C.S.R., Kommalapati, R.K., Poosaria, C., Gontu, S.R., and Reddy, B.V.R. 2015. Role of Antioxidant in Facilitating The Body Function: A Review. *Oral Pathology and Microbiology*, 7(2): 71-75.
- Kehrer, J.P. and Biswal, S.S. 2000. The Molecular Effects of Acrolein. *The Journal of Toxicological Sciences*, 57: 6-15.
- Kenney, L.B., Laufer, M.R., Grant, F.D., Grier, H., and Diller, L. 2001. High Risk of Infertility and Long Term Gonadal Damage in Males Treated With High Dose Cyclophosphamide for Sarcoma During Childhood. *Cancer*, 91(3), 613-621.
- Khorwal, G., Chauhan, R., and Nagar, M. 2017. Effect of Cyclophosphamide on Liver in Albino Rats: A Comparative Dose Dependent Histomorphological Study. *International Journal of Biomedical and Advance Research*. 8(3): 102-107.
- Kim A.R., Yoon B.K., and Park H. 2016. Caffeine Inhibits Adipogenesis through Modulation of Mitotic Clonal Expansion and the AKT/GSK3 Pathway in 3T3-L1 Adipocytes. *BMB Reproduction*, 49: 111-115.
- Kim, W., Kim, S.H., Park, S.K., and Chang, M.S. 2012. Astragalus Membranaceus Ameliorates Reproductive Toxicity Induced by Cyclophosphamide in Male Mice. *Phytotherapy Research*, 26(9): 1418-1421.
- Kiyuna L.A., E Albuquerque R.P., Chen C.-H., Mochly-Rosen D., and Ferreira J.C. 2018. Targeting Mitochondrial Dysfunction and Oxidative Stress in Heart Failure: Challenges and Opportunities. *Free Radical Biology and Medicine*, 129: 155-168.

- Koppers, A.J., Garg, M.L., and Aitke, R.J. 2010. Stimulation of Mitochondrial Reactive Oxygen Species Production by Unesterified, Unsaturated Fatty Acids in Defective Human Spermatozoa. *Free Radical Biology and Medicine*, 48(1): 112–119.
- Koruk, M., Taysi, S., Savas, C., Yilmaz, O., Akcay, F., and Karakok, M. 2004. Oxidative Stress and Enzymatic Antioxidant Status in Patients with Nonalcoholic Steatohepatitis. *Annals of Clinical & Laboratory Science*, 34(1): 57-62.
- Kumar, P.V. and Venkatesh, Y.P. 2016. Alleviation of Cyclophosphamide-Induced Immunosuppression in Wistar Rats by Onion Lectin (*Allium cepa agglutinin*). *The Journal of Ethnopharmacology*, 186: 280-288.
- Kumar, S. and Pandey, A.K. 2013. Chemistry and Biological Activities of Flavonoids: An Overview. *The Scientific World Journal*, 10(4): 1567-1574
- Kumar, S. and Pandey, A.K. 2013. Phenolic Content, Reducing Power and Membrane Protective Activities of *Solanum xanthocarpum* Root Extracts. *Vegetos*. 26:301–307.
- Kumar, S., Chashoo, G., Saxena, A.K., and Pandey, A.K. 2013. Parthenium Hysterophorus: A Probable Source of Anticancer, Antioxidant and Anti- HIV Agents. *BioMed Research International*, 2013(3): 1-11.
- Langford, C. A. 1997. Complications of Cyclophosphamide Therapy. *Eur Arch Otorhinolaringol*, 254: 65-72.
- Lara, L.V., Pasqualotto, E.B., Borges Jr.E., Braga, D.P.A.F., Salvador, M., and Pasqualotto, F.F. 2008. Flavonoids May Increase Semen Quality in Infertile Men with Oligospermia?. 19: 190-191.
- Lasségue, B., San Martin, A. and Griendling, K.K. 2012. Biochemistry, Physiology, and Pathophysiology of NADPH Oxidases in the Cardiovascular System. *Circulation Research*, 110(10): 1364-1390.
- Lee, A.W.M., Tung, S. Y., Chan, A.T.C., Chappell, R., Fu, Y., Lu, T., Tan, T., Chua, D.T.T., O'Sullivan, B., Tung, R., Ng, W., Leung, T., Leung, S., Yau, S., Zhao, C., Tan, E., Au, G.K.H., Siu, L., Fung, K., and Lau, W. 2011. A Randomized Trial on Addition of Concurrent-Adjuvant Chemotherapy and/or Accelerated Fractionation for Locally-Advanced Nasopharyngeal Carcinoma. *Radiotherapy and Oncology*, 98(1): 15-22.
- Lee, C. and Longo, V.D. 2011. Fasting Versus Dietary Restriction in Cellular Protection and Cancer Treatment. *Oncogene*, 30(3): 3305-3316.
- Lee, C.Y., Sharma, A., Semenya, J., Anamoah, C., Chapman, K. N., and Barone, V. 2020. Computational Study of Ortho-substituent Effects on Antioxidant Activities of Phenolic Dendritic Antioxidants. *Antioxidants*, 9 (3): 189.
- Lee, J., Koo, N. and Min, D.B. 2004. Reactive Oxygen Species, Aging, and Antioxidative Nutraceuticals. *Comprehensive Reviews in Food Science and Food Safety*, 3(1): 21-33.

- Le, T., Bhushan, V., Sochat, M., and Chavda, Y. 2017. *First Aid for The USMLE Step 1, 1st Ed.* McGraw-Hill Education: New York , NY, USA, 416-419 p.
- Leko, B.J., Olawuyi, S.T., and Okun, L.U. 2021. The Mitigating Effect of *Ananas comosus* on Aluminum-Induced Oxidative Stress on the Testes Of Adult Male Wistar Rats. *JoBAZ*.
- Levine, A.J. 2020. 800 Million Years of Evolution and 40 Years of Discovery. *Nature Reviews Cancer*, 20: 471–480.
- Liang, J., Huang, M., Duan, W., Yu, X-Q., and Zhou, S. 2007. Design of New Oxazaphosphorine Anticancer Drugs. *Current Pharmaceutical Design*, 13:963-978.
- Liu, Z., Lu, H., Shi, H., Du, Y., Yu, J., Gu, S., Chen, X., Liu, K.J., and Hu C.A. 2005. PUMA Overexpression Induces Reactive Oxygen Species Generation and Proteasome-Mediated Stathmin Degradation in Colorectal Cancer Cells. *Cancer Research*, 65:1647-1654.
- Lobo, V., Patil, A. and Chandra, N. 2010. Free Radicals, Antioxidants and Functional Foods: Impact on Human Health. *Pharmacognosy Reviews*, 4(8): 118-126.
- Logue, S.E. and Martin S.J. 2008. Caspase Activation Cascades in Apoptosis. *Biochemical Society Transactions*, 1(36): 1-9.
- Lu, J., Lin, P.H., Yao, Q., and Chen, C. 2010. Chemical and Molecular Mechanisms of Antioxidants: Experimental Approaches and Model Systems. *Journal of Cellular and Molecular Medicine*, 14(4): 840-860.
- Luo, L., Chen, H., Trush, M.A., Show, M.D., Anway, M.D., and Zirkin, B.R. 2006. Aging and the Brown Norway Rat Leydig Cell Antioxidant Defense System. *Journal of Andrology*, 27(2): 240-247.
- Luthfi, M.J. 2015. A Simple and Practical Method for Rat Epididymal Sperm Count (*Rattus norvegicus*). *Biology, Medicine and Natural Product Chemistry*, 4(1): 1-3.
- Mallidis, C., Lim, T.C., Hill, S.T., Skinner, D.J., Brown, D.J., and Johnston WI. 2000. Necrospemia and Chronic Spinal Cord Injury. *Fertility and Sterility*, 74(2): 221–227.
- Masselli, E., Pozzi, G., Vaccarezza, M., Mirandola, P., Galli, D., Vitale, M., Carubbi, C., and Gobbi, G. 2020. ROS in Platelet Biology: Functional Aspects and Methodological Insights. *International Journal of Molecular Sciences*, 21(14): 4866.
- Mathew, B.B., Tiwari, A. and Jatawa, S.K. 2011. Free Radicals and Antioxidant: A Review. *Journal of Pharmacy Research*, 4(12): 4340-4343.
- Mazzola, M., Carini, F., Rappa, F., and Jurjus, A. R. 2017. Colorectal Carcinogenesis: Role of Oxidative Stress and Antioxidants. *Anticancer Research*, 37(9).
- Meistrich, M.L., Mohapatra, B., Shirley, C.R., and Zhao, M. 2003. Roles of Transition Nuclear Proteins in Spermiogenesis. *Chromosoma*, 111: 483-488.

- Milisav, I., Ribaric, S. and Poljsak, B. 2018. Antioxidant Vitamins and Ageing. *Subcellular Biochemistry*, 90: 1-23.
- Mills, K.A., Chess-Williams, R. and McDermott, C. 2019. Novel Insight into Mechanism of Cyclophosphamide-Induced Bladder Toxicity: Chloroacetaldehyde's Contribution to Urothelial Dysfunction In Vitro. *Archives of Toxicology*, 93(11): 3291-3303.
- Mirazi, N., Baher, I. S., Izadi, Z., and Hosseini, A. 2021. The Protective Effect of *Rubus fruticosus* L. on Blood Composition in Cyclophosphamide Treated Male Rats. *Clinical Phytoscience*, 7: 33.
- Mishra A., Sharma A.K., Kumar S., Saxena A.K., and Pandey A.K. Bauhinia. 2013. Variegata Leaf Extracts Exhibit Considerable Antibacterial, Antioxidant, and Anticancer Activities. *BioMed Research International*, 2013: 10.
- Mishra, A., Kumar, S. and Pandey, A.K. 2013. Scientific Validation of The Medicinal Efficacy of *Tinospora cordifolia*. *The Scientific World Journal*, 2013(11-12): 1-8.
- Mohamed, I.H. 2021. Effect of Cyclophosphamide on Hematological and Physiological and Possible Protective Role of *Berberis Vulgaris* in Mice. *International Journal of Biological and Medical Research*, 3: 1-7.
- Mohammadi, F., Nikzad, H., Taghizadeh, M., Taherian, A., Azami-Tameh, A., Hosseini, S.M., and Moravveji, A. 2013. Protective Effect of *Zingiberofficinale* Extract on Rat Testis After Cyclophosphamide Treatment. *Andrologia*, 46: 680-686.
- Mohanty, S.K., and Singh, R. 2017. *Overview of Male Reproductive System*. Uttar Pradesh: Springer Nature Singapore Pte Ltd.
- Molyneux, G., Andrews, M., Sones, W., York, M., Barnett, A., Quirk, E., Yeung, W., and Turton, J. 2011. Haemotoxicity of Busulphan, Doxorubicin, Cisplatin, and Cyclophosphamide in the Female BALB/c Mouse Using a Brief Regimen of Drug Administration. *Cell Biology and Toxicology*, 27(1): 13-40.
- Moongkarndi, P., Kosem, N., Kaslungka, S., Luanratana, O., Pongpan, N., and Neungton, N. 2004. Antiproliferation, Antioxidation and Induction of Apoptosis by *Garcinia mangostana* (Mangosteen) on SKBR3 Human Breast Cancer Cell Line. *Journal of Ethnopharmacology*. 90: 161-166.
- Moskovtsev, S.I. and Librach, C.L. 2013. Methods of Sperm Vitality Assessment. *Methods in Molecular Biology*, 927: 13-19.
- Mourvaki, E., Cardinali, R., Bosco, A.D., Corazzi, L., and Castellini, C. 2010. Effects of Flaxseed Dietary Supplementation on Sperm Quality and on Lipid Composition of Sperm Subfractions and Prostatic Granules in Rabbit. *Theriogenology*, 73(5): 629-637.
- Mulyati, Fitria, R. and Hartantyo, R. Y. 2020. Petunjuk Praktikum Endokrinologi dan Reproduksi Hewan Program Pascasarjana Biologi. Yogyakarta: Laboratorium Fisiologi Hewan Fakultas Biologi Universitas Gadjah Mada.

- Murthy, P.S. and Naidu, M.M. 2012. Recovery of Phenolic Antioxidants and Functional Compounds from Coffee Industry By Products. *Food and Bioprocess Technology*, 5(3):897–903.
- Musatto, I.S., Machado, E.M.S., Martins, S., and Teixeira, J.A. 2011. Production, Composition, and Application of Coffee and Its Industrial Residues. *Food and Bioprocess Technology*, 4(5):661-672.
- Myburgh, K.H. 2014. Polyphenol Supplementation: Benefits for Exercise Performance or Oxidative Stress?. *Sports Medicine*, 1: S57-70.
- Naidu, M.M., G. Sulochanamma, S.R., Sampathu, and Srinivas, P. 2008. Studies on Extraction and Antioxidant Potential of Green Coffee. *Food Chemistry*, 107(1): 377-384.
- Nair, M., Nagamori, I., Sun, P., Mishra, D.P., Rheume, C., Li, B., Sassone-Corsi, P., and Dai, X. 2008. Nuclear Regulator Pygo2 Controls Spermiogenesis and Histone H3 Acetylation. *Developmental Biology*, 320:446-455.
- Nandini, C., Madhunapantula, S. V., Bovilla, V. R., Ali, M., Mruthunjaya, K., Santhepete, M. N., and Jayashree. 2021. Platelet Enhancement by *Carica papaya* L. Leaf Fractions in Cyclophosphamide Induced Thrombocytopenic Rats is Due to Elevated Expression of CD110 Receptor on Megakaryocytes. *Journal of Ethnopharmacology*. 275: 114074.
- Nardini, M., Scaccini, C., Packer, L., and Virgili, F. 2000. In Vitro Inhibition of the Activity of Phosphorylase Kinase, Protein Kinase C and Protein Kinase a by Caffeic Acid and a Procyanidin-Rich Pine Bark (*Pinus maritima*) Extract. *Biochimica et Biophysica Acta*, 1474(2): 219-255.
- Natella, F., Nardini, M., Belevi, F., Pignatelli, P., Di Santo, S., Ghiselli, A., Violi, F., and Scaccini, C. 2008. Effect of Coffee Drinking on Platelets: Inhibition of Aggregation and Phenols Incorporation. *British Journal of Nutrition*, 100(6): 1276-1282.
- Nie, H., Li, K.Y., Zhang, X.Q., Feng, X.Y., Yang, D.R., Wu, Y.S., Zhou, J. Y., and Ye, W.C. 2009. Establishment of a Mouse Thrombocytopenia Model Induced by Cyclophosphamide. *Zoological Research*, 30(6):645-652.
- Nijveldt R.J., van Nood E., Van Hoorn, D.E.C., Boelens P.G., van Norren K., and van Leeuwen P.A.M. 2001. Flavonoids: A Review of Probable Mechanisms of Action and Potential Applications. *American Journal of Clinical Nutrition*, 74(4):418-425.
- Nimse, S.B. and Pal, D. 2015. Free Radicals, Natural Antioxidants, and Their Reaction Mechanism. *The Royal Society of Chemistry*, 5(35): 27986-28006.
- Noblanc, A., Damon-Soubeyrand, C., Karrich, B., Henry-Berger, J., Cadet, R., Saez, F., Guiton, R., Janny, L., Pons-Rejraji H., and Alvarez J.G. 201. DNA Oxidative Damage in Mammalian Spermatozoa: Where and Why is the Male Nucleus Affected?. *Free Radical Biology and Medicine*, 65: 719-723.

- Nwokike, M.O., Ghasi, S.I., Ogbonna, A.O., and Anusiem, C.A. 2020. The Effect of *Imperata cylindrica* Root Aqueous Extracts on Serum Testosterone Levels of Hyperglycemic Rats. *Journal of Pharmaceutical Sciences*, 4: 187.
- OECD. 2001. Guidelines for Testing of Chemicals. Acute Oral Toxicities Up and Down Procedure Series, 425:1-26.
- OECD. 2018. *Repeated Dose 90-Day Oral Toxicity Study in Rodents*. OECD Guidelines for The Testing of Chemicals Series 408.
- Oger J. 2007. Immunosuppression: Promises and Failures. *Journal of the Neurological Sciences*, 259: 74-78.
- Ogino, M.H., Tadi, P. 2021. *Cyclophosphamide*. StatPearls Publishing.
- Ohno, M., Sakumi, K., Fukumura, R., Furuichi, M., Iwasaki, Y., Hokama, M., Ikemura, T., Tsuzuki, T., Gondo, Y., and Nakabeppu, Y. 2014. 8-Oxoguanine Causes Spontaneous De Novo Germline Mutations in Mice. *Scientific Reports*, 4: 4689.
- Olthof, M.R., Hollman, P.C.H. and Katan, M.B. 2001. Chlorogenic acid and caffeic acid are absorbed in humans. *Journal of Nutrition*, 131(1):66-71.
- Osawa T., Davies D., and Hartley J.A. 2011. Mechanism of Cell Death Resulting From DNA Interstrand Cross-Linking in Mammalian Cells. *Cell Death and Disease*, 2: 187.
- Oyagbemi, A., Omobowale, O., Asenuga, E., Akinleye, A., Ogunsanwo, R., and Saba, A. 2016. Cyclophosphamide-Induced Hepatotoxicity in Wistar Rats: The Modulatory Role of Gallic Acid as a Hepatoprotective and Chemopreventive Phytochemical. *International Journal of Preventive Medicine*, 7(51): 51-51.
- Oyagbemi, A.A., Omobowale, T.O., Saba, A.B., Adedara, I.A., Olowu, E.R., Akinrinde, A.S., and Dada, R.O. 2016. Gallic Acid Protects Against Cyclophosphamide-Induced Toxicity in Testis and Epididymis of Rats. *Andrologia*, 48: 393-401.
- Ozcan, A. and Ogun, M. 2015. *Biochemistry of Reactive Oxygen and Nitrogen Species*. Basic Principles and Clinical Significance of Oxidative Stress.
- Pacher, P., Beckman, J.S. and Liaudet, L. 2007. Nitric Oxide and Peroxynitrite in Health and Disease. *Physiological Reviews*, 87(1): 315-424.
- Pandey, A.K., Mishra, A.K. and Mishra, A. 2012. Antifungal and Antioxidative Potential of Oil and Extracts Derived from Leaves of Indian Spice Plants *Cinnamomum tamala*. *Cellular and Molecular Biology*, 58(1): 142-147.
- Panggabean, E. 2011. *Buku Pintar Kopi*. Jakarta Selatan: PT Agro Media Pustaka.
- Parhizkar, S., Yusoff, M.J. and Dollah, M.A. 2013. Effect of *Phaleria macrocarpa* on Sperm Characteristics in Adult Rats. *Advanced Pharmaceutical Bulletin*, 3(2): 345-352.
- Patel, S., Panda, S., Nanda, R., Mangaraj, M., and Mohapatra, P.C. 2009. Influence of Oxidants and Anti-oxidants on Semen Parameters in Infertile Males. *Journal of Indian Medical Association*, 107(2): 78-80.

- Pavin, N.F., Izaguirry, A.P., Soares, M.B., Spiazzi, C. C., Mendez, A. S. L., Leivas, F.G. Brum, D.d., and Cibir, F.W.S. 2018. Tribulus terrestris Protects against Male Reproductive Damage Induced by Cyclophosphamide in Mice. *Oxidative Medicine and Cellular Longevity*, 2018(10): 1-9.
- Pawlowska, E., Szczepanska, J., Koskela, A., Kaarniranta, K., and Blasiak, J. 2019. Dietary Polyphenols in Age-Related Macular Degeneration: Protection against Oxidative Stress and Beyond. *Oxid. Oxidative Medicine and Cellular Longevity*.
- Peris, I.S., Bilodeau, J.F., Dufour, M., and Bailey, J. 2007. Impact of Cryopreservation and Reactive Oxygen Species on DNA Integrity, Lipid Peroxidation, and Functional Parameters in Ram Semen. *Molecular Reproduction and Development*, 74:878-892.
- Peris-Frau, P., Soler, A.J., Iniesta-Cuerda, M., Martin-Maestro, A., Sanchez-Ajofrin, I., Medina-Chavez, D.A., Fernandez-Santos, M.R., Garcea-Alvarez, O., Maroto-Morales, A., Montoro, V., and Garde, J.J. 2020. Sperm Cryodamage in Ruminants: Understanding the Molecular Changes Induced by the Cryopreservation Process to Optimize Sperm Quality. *International Journal of Molecular Sciences*, 21: 2781.
- Pham-Huy, L.A., He, H. and Pham-Huy, C. 2008. Free Radicals, Antioxidant in Disease and Health. *International Journal of Biomedical Science*, 4(2): 89-96.
- Phaniendra, A., Jestadi, D.B. and Periyasami, L. 2015. Free Radicals: Properties, Sources, Targets, and Their Implication in Various Diseases. *Indian Journal of Clinical Biochemistry*, 30 (1): 11-26.
- Pietras, K. and Hanahan, D. 2005. A Multitargeted, Metronomic, and Maximum-Tolerated Dose “Chemo-Switch” Regimen is Antiangiogenic, Producing Objective Responses and Survival Benefit in a Mouse Model of Cancer. *Journal of Clinical Oncology*, 23(5): 939-52.
- Pistritto, G., Trisciuglio, D., Ceci, C., Garufi, A., and D’Orazi G. 2016. Apoptosis as Anticancer Mechanism: Function and Dysfunction of its Modulators and Targeted Therapeutic Strategies. *Aging (Albany NY)*, 8: 603-619.
- Pizzino, G., Irrera, N., Cucinotta, M., Pallio, G., Mannino, F., Arcoraci, V., Squadrito, F., Altavilla, D., and Bitto, A. 2017. Oxidative Stress: Harms and Benefits for Human Health. *Oxidative Medicine and Cellular Longevity*.
- Poirault-Chassac, S., Nivet-Antoine, V., Houvert, A., Kauskot, A., Lauret, E., Lai-Kuen, R., Dusanter-Fourt, I., and Baruch, D. 2021. Mitochondrial Dynamics and Reactive Oxygen Species Initiate Thrombopoiesis From Mature Megakaryocytes. *Blood Advances*, 5 (6): 1706-1718.
- Prasetyo, S., Wesley, A., and Tedi, H. 2015. *The Pre-Chromatography Purification Of Crude Oleoresin of Phaleria Macrocarpa Fruit Ekstracts by Using 70%-v/v Etanol*. Pengembangan Teknologi Kimia untuk Pengolahan Sumber Daya Alam Indonesia, Yogyakarta.

- Prata, E.R.B.A. and Oliveira, L.S. 2006. Fresh Coffe Husks as Potential Sources of Anthosianin. *LWT Food Science and Technology*, 40(9): 1555-1560.
- Putri, A.P. 2015. Efek Vitamin C terhadap Kualitas Spermatozoa yang Diberi Paparan Asap Rokok. *Journal of Majority*, 4(1): 1-4.
- Qi, W., Qiao, D., and Martinez, J.D. 2002. Caffeine Induces TP53-Independent G(1)-Phase Arrest and Apoptosis in Human Lung Tumor Cells in a Dose-Dependent Manner. *Radiation Research*, 157: 166-174.
- Qin, W.S., Deng, Y.H., and Cui, F.C. 2016. Sulforaphane Protects Against Acrolein-Induced Oxidative Stress and Inflammatory Responses: Modulation of Nrf-2 and COX-2 Expression. *Archives of Medical Science*, 12 (4): 871-880.
- Rahardjo, P. 2012. *Panduan Budidaya dan Pengolahan Kopi Arabika dan Robusta*. Jakarta: Penebar Swadaya.
- Rahman, S.U., Huang, Y., Zhu, L., Feng, S., Khan, I.M., Wu, J., Li, Y., and Wang, X. 2018. Therapeutic Role of Green Tea Polyphenols in Improving Fertility: A Review. *Nutriens*, 10(7): 835.
- Ralhan, R. dan Kaur, J. 2007. Alkylating Agents and Cancer Therapy. *Expert Opinion on Therapeutic Patents*, 17(9): 1061-1075.
- Rani, S., Rasyid, R. dan Desmawati, D. 2018. High Intake of Green Tea Decreased Hemoglobin and Hematocrit Levels in *Rattus norvegicus* Strain Wistar Albino. *International Journal of Research in Medical Science*, 6 (11): 3688-3692.
- Rayman, M.P., 2005. Selenium in Cancer Prevention: A Review of The Evidence and Mechanism of Action. *Proceedings of the Nutrition Society*, 64(4): 527-542.
- Rezvanfar, M. dan Sadrkhanlou, R.A. 2008. Protection of Cyclophosphamide-Induced Toxicity in Reproductive Tract Histology, Sperm Characteristics, and DNA Damage by an Herbal Source; Evidence for Role of Free-Radical Toxic Stress. *Hum Exp Toxicol*, 27(12): 901-910.
- Rifkind, J.M., Ramasamy, S., Manoharan, P.T., Nagababu, E., and Mohanty, J.G. 2004. Redox Reactions of Hemoglobin. *Antioxidants and Redox Signaling*, 6(3): 657-666.
- Rodríguez-Durán, L.V., Ramírez-Coronel, M.A., Aranda-Delgado, E., Nampoothiri, K.M., Favela-Torres, E., Aguilar, C.N., and Saucedo-Castañeda, G. 2014. Soluble and Bound Hydroxycinnamates in Coffee Pulp (*Coffea arabica*) from Seven Cultivars at Three Ripening Stages. *Journal of Agricultural and Food Chemistry*, 62(31): 7869-7876.
- Roychoudhury, S., Chakraborty, S., Choudhury, A.P., Das, A., Jha, N.K., Slama, P., Nath, M., Massanyi, P., Ruokolainen, J., and Kesari, K.K. 2021. Environmental Factors-Induced Oxidative Stress: Hormonal and Molecular Pathway Disruptions in Hypogonadism and Erectile Dysfunction. *Antioxidant*, 10(6): 837.

- Ruijters, E.J.B., Weseler, A.R., Kicken, C., Haenen, G.R.M.M., and Bast, A. 2013. The Flavanol (-)-epicatechin and Its Metabolites Protect Against Oxidative Stress in Primary Endothelial Cells Via a Direct Antioxidant Effect. *European Journal of Pharmacology*, 715(1-3): 147-153.
- Russell, E.R., Hikim, A.P.S., and Clegg, E.D. 1990. *Histological and Histopathological Evaluation of the Testis*. Cache River Press, Clearwater.
- Sadeghzadeh, F., Sadeghzadeh, A., Ashtiyani, S.C., Bakhshi, S., Mashayekhi, F. J., Mashayekhi, M., Poorcheraghi, H., Zarei, A., and Jafari, M. 2019. The Effect of Hydro-Alcoholic Extract of *Ceratonia siliqua* L. on Spermatogenesis Index in Rats Treated with Cyclophosphamide: An Experimental Study. *International Journal of Reproductive BioMedicine*, 18(4): 295-305.
- Sakihama, Y., Cohen, M.F., Grace, S.C., and Yamasaki H. 2002. Plant Phenolic Antioxidant and Prooxidant Activities: Phenolics-Induced Oxidative Damage Mediated by Metals in Plants. *Toxicology*, 177: 67-80.
- Saleh, M., Shamsasanjan, K., Movassaghpourakbari, A., Akbarzadeh-laleh, P., and Molaeipour Z. 2015. The Impact of Mesenchymal Stem Cells on Differentiation of Hematopoietic Stem Cells. *Advanced Pharmaceutical Bulletin*, 5:299-304.
- Salman. K.A. and Ashraf, S. 2013. Reactive Oxygen Species: A Link between Chronic Inflammation and Cancer. *Asia-Pacific Journal of Molecular Biology and Biotechnology*, 21(2): 42-49.
- Sapiro, R., Kostetskii, I., Olds-Clarke, P., Gerton, G.L., Radice, G.L., and Strauss, I.J. 2002. Male Infertility, Impaired Sperm Motility, and Hydrocephalus in Mice Deficient in Sperm-Associated Antigen 6. *Molecular and Cellular Biology*, 22(2002): 6298-6305.
- Selvakumar, E., Prahalthan, C., Sudharsan, P.T., and Varalakshmi, P. 2006. Chemoprotective Effect of Lipoic Acid Against Cyclophosphamide Induced Changes in the Rat Sperm. *Toxicology*, 217(1): 71-8.
- Setiawan, H., Maliza, R., Maulana, S.A., and Hisbullah, M.I. 2020. The Effect of Coffee Fruit Skin Extract on Sperm Characteristics and Testicular of Mice With Ethanol-Induced. *Jurnal Biodjati*, 5(2): 259-270.
- Setyawati, I., Ermayanti, N.G.A.M., Suami, N.M.R., Narayani, I., and Suaskara, I.B.M., 2017. Testicular Histology and Blood Testosterone Levels Of Male Rabbit After Given Concentrated Diets Containing Calliandra Leaf Meal and Pineapple Peels. *Journal of Physics: Conference Series*, 983.
- Shabaan, S., Madi, N., Elgharib, M., and Nasif, E. 2021. Study the Effect of Silymarin on Cyclophosphamide Induced Testicular Damage in Adult Albino Rats. *Bulletin of Egyptian Society for Physiological Sciences*, 41(4): 553-564.
- Shukla, K.K., Mahdi, A.A., and Rajender S. 2012. Apoptosis, Spermatogenesis and Male Infertility. *Frontiers in Bioscience-Scholar*, 1: 746-754.

- Singh, S., Mishra, A.K., Lata, S., and Tiwari, K.N. 2017. Aggravation of Cyclophosphamide-Induced Reproductive Toxicity in Mice by Aqueous Extract of *Aeglemarmelos* (L.). *Braz. Journal of Pharmaceutical Sciences*, 53(3).
- Sobiesiak, M. 2017. Chemical Structure of Phenols and Its Consequence for Sorption Processes. *Phenolic Compounds Natural Science, Importance and Application*.
- Soderquist, L., Rodriguez-Martinez, H., and Janson L. 1991. Post-thaw Motility, ATP Content and Cytochrome C Oxidase Activity of AI Bull Spermatozoa in Relation to Fertility. *Zentralbl Veterinarmed A*. 38: 165-174.
- Spiridonov, N.A., Wong, L., Zerfas, P.M., Starost, M.F., Pack, S.D., Pawaletz, C.P., and Johnson, G.R. 2005. Identification and Characterization of SSTK, A Serine/Threonine Protein Kinase Essential for Male Fertility. *Molecular and Cellular Biology*, 25: 4250-4261.
- Stagos, D. Antioxidant Activity of Polyphenolic Plant Extracts. *Antioxidant*, 9(1): 19.
- Stevens, J.F. and Maier, C.S. 2008. Acrolein: Sources, Metabolism, and Biomolecular Interactions Relevant to Human Health and Disease. *Molecular Nutrition and Food Research*, 52(1): 7-25.
- Stone, J.R. and Yang, S. 2006. Hydrogen Peroxide: A Signaling Messenger. *Antioxidants & Redox Signaling*, 8: 243-270.
- Stork, C.M. and Schreffler, S.M. 2014. *Cyclophosphamide*. New York: Upstate Medical University.
- Sun, Y., Ito, S., Nishio, N., Tanaka, Y., Chen, N., Liu, L., and Isobe, K.I. 2015. Enhancement of the Acrolein-Induced Production of Reactive Oxygen Species and Lung Injury By GADD34. *Oxidative Medicine and Cellular Longevity*, 2015: 170309.
- Szabo, C., Ischiropoulos, H. and Radi, R. 2007. Peroxynitrite: Biochemistry, Pathophysiology and Development of Therapeutic. *Nature Reviews Drug Discovery*, 6(8): 662-680.
- Tabrizi, R., Saneei, P., Lankarani, K.B., Akbari, M., Kolahdooz, F., Esmailzadeh, A., Nadi-Ravandi, S., Mazoochi, M., and Asemi, Z. 2018. The Effects of Caffeine Intake on Weight Loss: A Systematic Review and Dos-Response Meta-Analysis of Randomized Controlled Trials. *Critical Reviews in Food Science and Nutrition*, 59(16): 2688-2696.
- Takeshima, T., Kuroda, S., Yumura, Y., and Cristiana F. 2018. *Reactive Oxygen Species (ROS) in Living Cells*. UK: Intechopen.
- Tanaka, H., Iguchi, N., Toyama, Y., Kitamura, K., Takahashi, T., Kaseda, K., Maekawa, and Nishimune, Y. 2004. Mice Deficient in The Axonemal Protein Tektin-T Exhibit Male Infertility and Immotile-Cilium Syndrome Due to Impaired Inner Arm Dynein Function. *Molecular and Cellular Biology*, 24: 7958-7964.

- Tanel, A. and Averill-Bates, D.A. 2007. Activation of the Death Receptor Pathway of Apoptosis by the Aldehyde Acrolein. *Free Radical Biology and Medicine*, 42(6): 798-810.
- Topdag, S., Aslaner, A., Tataroglu, C., and Iice, Z. 2005. Evaluation of Antioxidant Capacity in Lung Carcinoma. *Indian Journal of Thoracic and Cardiovascular Surgery*, 21: 269-71.
- Torabi, F., Shafaroudi, M.M. and Rezaei, N. 2017. Combined Protective Effect of Zinc Oxide Nanoparticles and Melatonin on Cyclophosphamide-Induced Toxicity in Testicular Histology and Sperm Parameters in Adult Wistar Rats. *International Journal of Reproductive BioMedicine*, 15(7): 403-412.
- Toussaint, O., Medrano, E. E. and Von, Z. T. 2000. Cellular and Molecular Mechanisms of Stress-Induced Premature Senescence (SIPS) of Human Diploid Fibroblasts and Melanocytes. *Experimental Gerontology*, 35(8): 927-945.
- Touyz, R.M. 2005. Reactive Oxygen Species As Mediators of Calcium Signaling by Angiotensin II: Implication in Vascular Physiology and Pathophysiology. *Antioxid Redox Signal*, 7(9-10): 1302-14.
- Trachootham, D., Alexandre J., and Huang P. 2009. Targeting Cancer Cells by ROS-Mediated Mechanisms: a Radical Therapeutic Approach?. *Nature Reviews Drug Discovery*, 8(7): 579-591.
- Tsikis D. 2017. Assessment of Lipid Peroxidation by Measuring Malondialdehyde (MDA) and Relatives in Biological Samples: Analytical and Biological Challenges. *Analytical Biochemistry*, 524: 13-30.
- Turner, T.T., Bang, H.J. and Lysiak, J.J. 2005. Experimental Testicular Torsion: Reperfusion Blood Flow and Subsequent Testicular Venous Plasma Testosterone Concentrations. *Urology*, 65: 390-394.
- Turrens, J.F. 2003. Mitochondrial formation of reactive oxygen species. *Journal of Physiology*. 552(2): 335-344.
- Tvrda, E., Massanyi, P. and Lukáč, N. 2018. *Physiological and Pathological Roles of Free Radicals in Male Reproduction*. Spermatozoa – Facts and Perspectives.
- Urban, J.A. 2003. Tamoxifen Induced Multinucleated Cells (Symplasts) and Distortion of Seminiferous Tubules in Rat Testis. *Asian Journal of Andrology*, 5: 217-220.
- Valavanidis, A., Vlachogianni, T. and Fiotakis, 2009. C. 8-Hydroxy-20-Deoxyguanosine (8-OHdG): A Critical Biomarker of Oxidative Stress and Carcinogenesis. *Journal of Environmental Science and Health*, 27(2): 12039.
- Venkataraman, N., Pamukuntla, S., Banoth, J., Boini, P., Sampathi, S., Swami, V., and Talla, V. 2015. Platelet Augmentation Activity of *Andrographis paniculata* Extract and Andrographolide Against Cyclophosphamide Induced Thrombocytopenia in Rats. *Pharmacy & Pharmacology International Journal*, 2(4): 126-131.

- Vernet, P., Aitken, R.J. and Drevet, J.R. 2004. Antioxidant Strategies in The Epididymis. *Molecular and Cellular Endocrinology*, 216(1-2):31-39.
- Verweij, J. and de Jonge, M.J.A. 2000. Achievements and Future of Chemotherapy. *European Journal of Cancer*, 36(12): 1479-1487.
- Vinas, M., Gruschwitz, M., Schweiggert, R.M., Guevara, E., Carle, E., Esquivel, P., and Jimenez, V.M. 2012. *Identification of Phenolic and Carotenoid Compounds in Coffee(Coffea Arabica) Pulp, Peels and Mucilage by HPLC-Electrospray Ionization Mass Spectrometry*. 24th International Conference on Coffee Science. ASIC Costa Rica.
- Wang, L., Sun, Y., Asahi, M., and Otsu, K. 2011. Acrolein, an Environmental Toxin, Induces Cardiomyocyte Apoptosis Via Elevated Intracellular Calcium and Free Radicals. *Cell Biochemistry and Biophysics*, 61(1): 131-136.
- Watcho, P., Mpeck, I.R., Defo, P.B.D., Wankeu-Nya, M., Ngadjui, E., Fozin, G.R.B., Kamtchouing, P., and Kamanyi, A. 2019. Cyclophosphamide-Induced Reproductive Toxicity: Beneficial Effects of *Helichrysum odoratissimum* (Asteraceae) in Male Wistar Rats. *Journal of Integrative Medicine*, 17(5): 366-373.
- WHO, 2018. *Latest Global Cancer Data: Cancer Burden Rises to 18.1 million new cases and 9.6 million cancer deaths in 2018*. Geneva: World Health Organization.
- WHO, 2020. *Latest Global Cancer Data: Cancer Burden Rises to 19.3 Million New Cases and 10.0 Million Cancer Deaths in 2020*. World Health Organization.
- Wu, W., Li, J., Chen, L., Ma, Z., Zhang, W., Liu, Z., Cheng, Y., Du, L., and Li, M. 2014. Bioluminescent Probe for Hydrogen Peroxide Imaging In Vitro and In Vivo. *Analytical Chemistry*, 86(19): 9800-6.
- Wuisan, M., Tendean, L., dan Rumbajan, J, M. 2016. Pengaruh Ekstrak Kulit Buah Manggis (*Garcinia mangostana* L.) Terhadap Kualitas Spermatozoa Tikus Wistar (*Rattus norvegicus*) yang Dipapari Asap Rokok. *Jurnal E-Biomedik*, 4(1): 193-198.
- Xu, S., Hu, S., Yu, X., Zhang, M., and Yang, Y. 2017. 17 α -hydroxylase/17,20-lyase Deficiency in Congenital Adrenal Hyperplasia: A Case Report. *Molecular Medicine Reports*, 15: 339-344.
- Yang, H., Wu, C., Liu, F., Wang, M., Zou, P., He, Y., Liu, Q., Zhou, Q., and Zhou, S. 2019. Blood Collection Through Subclavian Vein Puncture in Mice. *Journal of Visualized Experiments*, (147): 1-6.
- Yang, L.L., Lee, C.Y., and Yen, K.Y. 2000. Induction of Apoptosis by Hydrolyzable Tannin From *Eugenia jambos* L. on Human Leukemia Cells. *Cancer Letters*. 157: 65-75.
- Yang, Q., Huang, M., Cai, X., Jia, L., and Wang, S. 2019. Investigation on Activation in RAW264.7 Macrophage Cells and Protection in Cyclophosphamide-Treated Mice of *Pseudostellaria heterophylla* Protein Hydrolysate. *Food and Chemical Toxicology*, 134.

- Yin, H., Xu, L. and Porter, N.A. 2011. Free Radical Lipid Peroxidation: Mechanism and Analysis. *Chemical Reviews*, 111(10): 5944-5972.
- Zaruwa, M. Z., Ibok, N. I., Ibok, I. U., Onyenonachi, E. C., Danchal, C., Ahmed, A. G., Ahmed, M. U., and Sudi, I. Y. 2016. Effects of *Sterculia setigera* Del. Stem Bark Extract on Hematological and Biochemical Parameters of Wistar Rats. *Biochemistry Insights*, 9: 19-22.
- Zeb, A. 2020. Concept, Mechanism, and Application of Phenolic Antioxidant in Foods. *Journal of Food Biochemistry*, 44(9): 1-22.
- Zhang, H. and Tsao, R. 2016. Dietary Polyphenols, Oxidative Stress and Antioxidant and Anti-inflammatory Effects. *Current Opinion in Food Science*, 8: 33-42.
- Zhao, H., Jin, B., Zhang, X., Cui, Y., Sun, D., Gao, C., Gu, Y., and Cai, B. 2015. Yangjing Capsule Ameliorates Spermatogenesis in Male Mice Exposed to Cyclophosphamide. *Evidence-Based Complementary and Alternative Medicine*.
- Zhao, L., Yuan, X., Wang, J., Feng, Y., Ji, F., Li, Z., and Bian, J. 2019. A Review on Flavones Targeting Serine/Threonine Protein Kinases for Potential Anticancer Drugs. *Bioorganic & Medicinal Chemistry*, 27: 677-685.
- Zheng, X., and H. Hasegawa. 2016. Administration of Caffeine Inhibited Adenosine Receptor Agonist-Induced Decreases in Motor Performance, Thermoregulation, and Brain Neurotransmitter Release in Exercising Rats. *Pharmacology, Biochemistry, and Behavior*, 140: 82-89.
- Zhou, Y., Chen, X., Yi, R., Li, G., Sun, P., Qian, Y., and Zhao, X. 2018. Immunomodulatory Effect of *Tremella polysaccharides* Against Cyclophosphamide-Induced Immunosuppression in Mice. *Molecules*, 23(2): 239-239.
- Zhu, Z., Li, R., Fan, X., Lv, Y., Zheng, Y., Masudul Hoque, S.A., Wu, D., and Zeng, W. 2019. Resveratrol Improves Boar Sperm Quality Via 5AMP-activated Protein Kinase Activation During Cryopreservation. *Oxidative Medicine and Cellular Longevity*.