UNIVERSITAS
GADJAH MADA
**Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan**
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Aguiar, R.W., Ootani, M.A., Ascencio, S.D., Ferreira, T.P.S., dos Santos, M.M. and dos Santos, G.R., 2014, Fumigant Antifungal Activity of Corymbia citriodora and Cymbopogon winterianus Essential Oils and Citronellal against Three Fungal Species, *Sci. World J.*, 1–8.

Agustina, A., dan Jamilah, M., 2021, Kajian Kualitas Minyak Serai Wangi (Cymbopogon winterianus Jowitt.) pada CV AB dan PT. XYZ Jawa Barat, *Agric. J.*, 4(1): 63-71.

Alagga, A.A., Gupta,V., 2023, *Drug absorption*. StatPearls Publishing.

Alhumaid, S., Mutair, A. Al., Alawi, Z.Al., 2021, Antimicrobial susceptibility of gram-positive and gram-negative bacteria: a 5-year retrospective analysis at a multi-hospital healthcare system in Saudi Arabia, *Ann. Clin. Microbiol. Antimicrob.*, 20(1).

Amorim, J.L., Simas, D.L.R., Pinheiro, M.M.G., Moreno, D.S.A., Alviano, C.S., da Silva, A.J.R. and Fernandes, P.D., 2016, Anti-inflammatory Properties and Chemical Characterization of The Essential Oils of Four Citrus Species, *PLoS ONE*, 11, 4, e0153643.

Anwar, S.H., Antasari, M.,Hasni, D.,Safriani, N., Rohaya, S., Winarti, C., 2017, Kombinasi pati sukun termodifikasi OSA (Octenyl Succinic Anhydride) dan lesitin sebagai penstabil emulsi minyak dalam air, *J. Pascapanen*, 14(3):124 – 133.

Aripin, D., Julaeha, E., Dardjan, M., dan Cahyanto, A., 2015, Chemical composition of Citrus spp. and oral antimicrobial effect of Citrus spp. peels essential oils against Streptococcus mutans, *Padjadjaran J. Dent.*, 27(1): 1-11.

Aspinall, S.R., Parker, J.K. and Khutoryanskiy, V., 2021, Oral care product formulations, properties and challenges, *Colloids Surf. B. Biointerfaces*, 200.

Avoseh, O., Oyedeji, O., Rungqu, P., Nkeh-Chungag, B., Oyedeji, A., 2015, Cymbopogon species; ethnopharmacology, phytochemistry and the pharmacological importance, *Molecules*, 20:7438–53.

Balouiri, M., Sadiki, M. and Koraichi Ibnsouda, S., 2016, Methods for *in vitro* evaluating antimicrobial activity: A review, *J. Pharm. Anal.*, 6:71–79.

Bayala, B., Coulibaly, A.Y., Djigma, F.W., Nagalo, B.M., Baron, S., Figueredo, G., Lobaccaro, J.M.A. and Simpore, J., 2020, Chemical composition, antioxidant, anti-inflammatory and antiproliferative activities of the essential oil of

UNIVERSITAS GADJAH MADA
Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai Obat Kumur Pada Pencegahan Gingivitis Kehamilan
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Cymbopogon winterianus, a plant used in traditional medicine, *Biomol. Concepts*, 11(1):86–96.

Białoń, M., Krzyśko-Łupicka, T., Koszałkowska, M. and Wieczorek, P.P., 2014, The Influence of Chemical Composition of Commercial Lemon Essential Oils on the Growth of Candida Strains, *Mycopatholog.*, 177:29–39.

Böhme, Karola, Barros-Velázquez, J., Calo-Mata, P., Aubourg, Santiago P, Böhme, K, Barros-Velázquez, Á.J., Calo-Mata, Á.P. and Aubourg, S P, 2014, Antibacterial, Antiviral and Antifungal Activity of Essential Oils: Mechanisms and Applications, In, *Antimicrobial Compounds*, Springer, Heidelberg, pp.51–81.

Boyle, P., Koechlin, A., Autier, P., Wiley, J. and Allé, R., 2014, *Mouthwash Use and the Prevention of Plaque, Gingivitis and Caries*, Wiley Blackwell, Rosenorns Alle.

Brunello, G., Becker, K., Scotti, L., Drescher, D., Becker, J., John, G., 2022, Effect of three Chlorhexidine-based mouthwashes on human gingival fibroblasts: an *in vitro* study, *Appl. Sci.*,12(5):2417

Carrillo-De-Albornoz, A., Figuero, E., Herrera, D. and Bascones-Martínez, A., 2010, Gingival changes during pregnancy: II. Influence of hormonal variations on the subgingival biofilm, *J. Clin. Periodontol.*, 37: 230–240.

Caton, J.G., Armitage, G., Berglundh, T., Chapple, I.L.C., Jepsen, S., Kornman, K.S., Mealey, B.L., Papapanou, P.N., Sanz, M. and Tonetti, M.S., 2018, A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification, *J. Clin. Periodontol.*, 45(Suppl 20):S1–S8.

Chaturvedi, D. and Shrivastava Suhane, R.R.N., 2016, Basketfull Benefit of Citrus Limon, *Int. Res. J. Pharm.*, 7(6):1–4.

Chen, H., Khemtong, C., Yang, X., Chang, X., Gao, J., 2011, Nanonization strategies for poorly water-soluble drugs, *Drug Discover. Today*, 16(7-8):354–360.

Che Marzuki, N. H., Wahab, R. A., Abdul Hamid, M. (2019). An overview of nanoemulsion: concepts of development and cosmeceutical applications. *Biotechnol. Biotechnol. Equip*, 33(1):779–797.

Coelho, A. S., Laranjo, M., Gonçalves, A. C., Paula, A., Paulo, S., Abrantes, A. M., Caramelo, F., Ferreira, M. M., Silva, M. J., Carrilho, E., and Botelho, M. F., 2020, Cytotoxic effects of a chlorhexidine mouthwash and of an enzymatic mouthwash on human gingival fibroblasts, *Odontology*, 108(2), 260–270.

UNIVERSITAS
GADJAH MADA
**Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan**
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Cullen, S. P., Kearney, C. J., Clancy, D. M., and Martin, S. J., 2015, Diverse Activators of the NLRP3 Inflammasome Promote IL-1β Secretion by Triggering Necrosis, J. *Cell Rep*, 11 (10):1535–1548.

Curra, M., Martins, M.A.T., Lauxen, I.S., Pellicioli, A. C., Sant'Ana Filho, M., Pavesi, V. C., Carrard, V. C., and Martins, M. D. , 2013, Effect of topical chamomile on immunohistochemical levels of IL-1β and TNF-α in 5-fluorouracil-induced oral mucositis in hamsters. *Cancer Chemother. Pharmacol.*, 71:293–299.

Dangol, S., Poudel, D.K., Ojha, P.K., 2023, Essential oil composition analysis of Cymbopogon species from eastern Nepal by GC-MS and chiral GC-MS, and antimicrobial activity of some major compounds, *Molecules*, 28(2):543

Dantas, M. L., Oliveira, J. M., Carvalho, L., Passos, S. T., Queiroz, A., Guimarães, L. H., Machado, P., Carvalho, E., and Arruda, S., 2014, Comparative analysis of the tissue inflammatory response in human cutaneous and disseminated leishmaniasis, *Mem. Inst. Oswaldo Cruz.*, 109(2), 202–209.

Dara, H., Dinesh, S. and Ravichander, T., 2017, Evaluation of Analgesic and Anti-Inflammatory Activity of Citrus Limon Peel in Albino Wistar Rats, *Int. J. Chem. Pharm. Sci.*, 5(6):165–169.

de Toledo, L.G., dos Santos Ramos, M.A., Spósito, L., Castilho, E.M., Pavan, F.R., de Oliveira Lopes, É., Zocolo, G.J., Silva, F.A.N., Soares, T.H., dos Santos, A.G., Bauab, T.M. and de Almeida, M.T.G., 2016, Essential oil of Cymbopogon winterianus (L.) Rendle: A strategy to combat fungal infections caused by Candida species, *Int. J. Mol. Sci.*, 17(8):1–16.

Devi, M.A., Sahoo, D., Singh B.T., Rajashekar Y., 2021, Antifungal activity and volatile organic compounds analysis of essential oils from Cymbopogon species using solid-phase microextraction-gas chromatography-mass spectrometry, *J. Agric. Food Res.*, 3:100110.

Deus, F.P., and Ouanounou, A., 2022, Chlorhexidine in Dentistry: Pharmacology, Uses, and Adverse Effects, *Int. Dent. J.*, 72(3):269–277.

DePaola, L.G. and Eshenaur Spolarich, A., 2007, Safety and Efficacy of Antimicrobial Mouthrinses in Clinical Practice, *J. Dent. Hyg*., 81(5):1-18.

Dewi, Z.Y., Nur, A., Hertriani, T., 2015, Efek antibakteri dan penghambatan biofilm ekstrak sereh (Cymbopogon winterianus L.) terhadap bakteri Streptococcus mutans, *Maj Ked Gi Ind.* , 1(2):136–141.

Dosoky, N.S. and Setzer, W.N., 2018, Biological activities and safety of citrus spp. essential oils, *Int. J. Mol. Sci.*, 19:1966.

UNIVERSITAS GADJAH MADA
Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai Obat Kumur Pada Pencegahan Gingivitis Kehamilan
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Dreamstime.com, https://www.dreamstime.com/green-leaves-pattern-cymbopogon-winterianus-garden-green-leaves-pattern-cymbopogon-winterianus-garden-image198089188 (diakses 6 Agustus 2021).

El Aboubi, M., Ben Hdech, D., Bikri, S., Benayad, A., El Magri, A., Aboussaleh, Y., Aouane, E.M., 2023, Chemical composition of essential oils of *Citrus limon* peel from three Moroccan regions and their antioxidant, anti-inflammatory, antidiabetic and dermatoprotective properties. *J. Herbmed. Pharmacol*., 12(1):118-127.

El Hassan, N. K. B., and Ramadan, A. M., 2023, Interleukin 1 beta and its association with the periodontal health of pregnant women. *J. Taibah Univ. Med. Sci.*, 18(6): 1376–1383.

Ermawati, D.E., Rohmani, S., Beandrade, M.U., 2023, *Sistem nanoemulsi untuk sediaan kosmetik*, Pena Persada Kerta Utama, pp:1-13;28-35.

Farah, C.S., McIntosh, L. and McCullough, M.J., 2009, Mouthwashes, *Aust. Prescr*., 32(6):162–164.

Festing, M.F., 2018, On determining sample size in experiments involving laboratory animals, *Lab. Anim.*, 52(4):341-350.

Figuero, E., Carillo-de-Albornoz, A., Herrera, D., Bascones-Martinez, A., 2010, Gingival changes during pregnancy: I. influence of hormonal variations on clinical and immunological parameters, *J. Clin. Periodontol.*, 37:220–229.

Figuero, E., Carrillo-De-Albornoz, A., Martín, C., Tobías, A. and Herrera, D., 2013, Effect of pregnancy on gingival inflammation in systemically healthy women: a systematic review, *J. Clin. Periodontol.*, 40:457–473.

Figuero, E., Han, Y.W., Furuichi, Y., 2020, Periodontal diseases and adverse pregnancy outcomes: Mechanisms. *Periodontol. 2000*, 83(1):175–188.

Fiyani, A., Saridewi, N., Suryaningsih, S., 2020, Analisis konsep kimia terkait dengan pembuatan surfaktan dari ampas tebu, *J. Riset Pend. Kimia*, 2020,10(2):94-101.

Flemingson, E.P., Ambalavanan, N., Ramakrishnan, T., Vijayalakshmi, R., 2008, Effect of three commercial mouth rinses on cultured human gingival fibroblast: an *in vitro* study, *Indian Dent. Res.*, 19(1):29–35.

Freimoser, F.M., Jakob, C.A., Aebi, M. and Tuor, U., 1999, The MTT [3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide] Assay Is a Fast and Reliable Method for Colorimetric Determination of Fungal Cell Densities, *Appl. Environ. Microbiol.*, 65(8):3727–3729.

UNIVERSITAS GADJAH MADA
Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai Obat Kumur Pada Pencegahan Gingivitis Kehamilan
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Gandhi, H.S., Dodiya, T. and Patel, V., 2020, A Systemic Review : Herbal Mouthwash for Effective Oral Care, *Int. J. Res. Anal. Rev.*, 7(4):126–131.

Gehrig, J.S. and Willmann, D.E., 2016, *Foundations of Periodontics for the Dental Hygienist*, edisi ke 4, Wolter Kluwer, Philadelphia.

Güncü, G.N., Tözüm, T.F. and Çağlayan, F., 2005, Effects of endogenous sex hormones on the periodontium - review of literature, *Aus. Dent. J.*, 50(3): 138–145.

Gurpreet, K., Singh S.K., 2018, Review of nanoemulsion formulation and characterization techniques, *Indian J. Pharm. Sci*., 80(5):781–789.

Hemalatha, V., Manigandan, T., Sarumathi, T. and Aarthi Nisha, V Amudhan, A., 2013, Dental Considerations in Pregnancy-A Critical Review on the Oral Care, *J. Clin. Diag. Res.*, 7(5):948–953.

Hernawan, I., Radithia, D., Hadi, P. and Ernawati, D.S., 2015, Fungal inhibitory effect of Citrus Limon peel essential oil on Candida albicans, *Dent. J.*, 48(2):84–88.

How, K.Y., Song, K.P. and Chan, K.G., 2016, Porphyromonas gingivalis: An Overview of Periodontopathic Pathogen below the Gum Line, *Front. microbiol.*, 7(53):1–14.

Huang, S., Li, R., Zeng, X., He, T., Zhao, H., Chang, A., Bo, C., Chen, J., Yang, F., Knight, R., Liu, J., Davis, C. and Xu, J., 2014, Predictive modeling of gingivitis severity and susceptibility via oral microbiota, *ISME J.*, 8:1768–1780.

Irwan, A., Humaida, N., Nur, H.S., 2020, Antibacterial activity assay of essential oils from limau kuit peel against Staphylococcus aureus, *IOP Conf. Ser. Mater. Sci. Eng*., 980(012026):1-7.

ISO 16408, 2015, Dentistry-oral care products-oral rinses, *International Organization for Standardization*. Geneva

ISO 10993-5, 2009, Biological Evaluation of Medical Devices – Part 5: Test for in vitro cytotoxicity. *International Organization for Standardization*. Geneva

Jain, K., Kumar, R.S., Sood, S., dan Gowthamarajan, K., 2013, Enhanced oral bioavailability of atorvastatin via oil in water nanoemulsion using aqueous titration method, *J. Pharm. Sci. & Res.*, 5(1):18-25.

Jaiswal, M., Dudhe, R., Sharma, P. K., 2015, Nanoemulsion: an advanced mode of drug delivery system, *3 Biotech*, *5*(2):123–127

Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Ji, S., and Choi, Y., 2013, Innate immune response to oral bacteria and the immune evasive characteristics of periodontal pathogens, *J. Periodontal Implant Sci.*, 4*3*(1):3–11

Jiang, H., Xiong, X., Buekens, P., Su, Y. and Qian, X., 2015, Use of mouth rinse during pregnancy to improve birth and neonatal outcomes: A randomized controlled trial, *BMC Pregnancy and Childbirth*, 15(311):1–7.

Julaeha, E., Herlina,T., Nurzaman, M., Mayanti, T., Kurnia, D., Sari, E.F., 2021, The antibacterial effect of β-pinene derived from Citrus aurantifolia peel against oral Streptococcus mutans ATCC 25175, *Padjadjaran J. Dent.*, 33(1):88-93.

Juniatik, M., Hidayati, K., Wulandari, F.P., Pangestuti, N., Munawaroh, I., Martien, R. and Utami, S., 2017, Formulation Of Nanoemulsion Mouthwash Combination of Lemongrass Oil (Cymbopogon citratus) and Kaffir Lime Oil (Citrus hystrix) Against Candida albicans ATCC 10231, *Trad. Med. J.*, 22(1):7–15.

Kamal, H.Z.A., Ismail, T.N.N.T., Arief, E.M. and Ponnuraj, K.T., 2020, Antimicrobial activities of citronella (Cymbopogon nardus) essential oil against several oral pathogens and its volatile compounds, *Padjadjaran J. Dent.*, 32(1):1–7.

Kaur, G., Grover, V., Bhaskar, N., Kaur, R.K. dan Jain, A., 2018, Periodontal infectogenomics, *Inflamm Regen.*, 38(8):1–1.

Kaur, H., Bhardwaj, U. and Kaur, R., 2021, Cymbopogon winterianus essential oil: a comprehensive review on its chemistry and bioactivity, *J. Ess. Oil Res.*, 33(3):205–220.

Kementerian Kesehatan RI, 2012, *Pedoman Pemeliharaan Kesehatan Gigi dan Anak Usia Balita Bagi Tenaga Kesehatan di Fasilitas Pelayanan Kesehatan*, Kementerian Kesehatan RI, Jakarta.

Kemp, SE., Hoolywood, T and Hort, J., 2009, Sensory evaluation, Wiley-Blackweel, Singapore.

Kia, P.Y., Safajou, F., Shahnazi, M. and Nazemiyeh, H., 2014, The effect of lemon inhalation aromatherapy on nausea and vomiting of pregnancy: A double-blinded, randomized, controlled clinical trial, *Iran. Red Crescent Med. J.*, 16(3):e14360.

Kilcast D.,1996, Organoleptic assessment In: Katan LL, editor. Migration from Food Contact Materials. Boston, MA: Springer US,p. 51–76.

UNIVERSITAS
GADJAH MADA
**Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan**
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Koffi, K., Komla, S., Catherine, G., Christine, R., Jean-Pierre, C. and Laurence, N., 2009, *In vitro* cytotoxic activity of Cymbopogon citratus L. and Cymbopogon winterianus L. essential oils from Togo, *Bangladesh J. Pharmacol.*, 4:29–34.

Komine-Aizawa, S., Aizawa, S. and Hayakawa, S., 2019, Periodontal diseases and adverse pregnancy outcomes, *J. Obstet. Gynaecol. Res.*, 45(1):5–12.

Kpoviessi, S., Bero, J., Agbani, P., Gbaguidi, F., Kpadonou-Kpoviessi, B., Sinsin, B., Accrombessi, G., Frédérich, M., Moudachirou, M. and Quetin-Leclercq, J., 2014, Chemical composition, cytotoxicity and *in vitro* antitrypanosomal and antiplasmodial activity of the essential oils of four Cymbopogon species from Benin, *J. Ethnopharmacol.*, 151(1):652–659.

Kumar, P.S. and Raj, A.J., 2015, Effects of Alcohol Containing Mouthwash on Oral Tissue: A Review, *Int. J. Sci. Res.*, 6(6):1584–1587.

Kuo, P. J., Hung, T. F., Lin, C. Y., Hsiao, H. Y., Fu, M. W., Hong, P. D., Chiu, H. C., Fu, E., 2017, Carvacrol ameliorates ligation-induced periodontitis in rats. *J. Periodontol.*, 88(7):e120–e128.

Lakshman, S., 2012, *Essential Microbiology for Dentistry*,5th ed, Elsevier,

Laleman I., Teughels W., 2020, Novel natural product-based oral topical rinses and toothpastes to prevent periodontal diseases, *Periodontol. 2000*, 84(1):102–123.

Leal, A. S., de Oliveira, A. E., Brito, L. M., Lopes, F. F., Rodrigues, V. P., Lima, K. F., de Araújo Martins, I. C., 2015, Association between chronic apical periodontitis and low-birth-weight preterm births, *J. Endod.*, 41(3):353–357.

Li, Z.H., Cai, M., Liu, Y.S., Sun, P.L. and Luo, S.L., 2019, Antibacterial Activity and Mechanisms of Essential Oil from Citrus medica L. Var. Sarcodactylis, *Molecules*, 24(8):1–10.

Lieske, B., Makarova, N., Jagemann, B., Walther, C., Ebinghaus, M., Zyriax, B. C., and Aarabi, G., 2022, Inflammatory Response in Oral Biofilm during Pregnancy: A Systematic Review, *Nutrients*, 14(22):4894.

Linde, J., Lang, N.P., and Karring, T., 2008, *Clinical Periodontology and Implant Dentistry*, 5th edition. Blackwell Publishing Company, UK, pp 51.

Listyarifah, D., Al-Samadi, A., Salem, A., Syaify, A., Salo, T., Tervahartiala, T., Grenier, D., Nordström, D. C., Sorsa, T., and Ainola, M., 2017, Infection and apoptosis associated with inflammation in periodontitis: An immunohistologic study, *Oral Dis.*, 23(8):1144–1154

UNIVERSITAS
GADJAH MADA
**Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan**
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Liu, Y., Liu, P., Wang, L., Shi, Y., Chen, J., Wang, H.J. and Zhang, X., 2020, Inhibitory effects of citrus lemon oil and limonene on Streptococcus sobrinus – Induced dental caries in rats, *Arch. Oral Biol.*, 118:104851.

Lopez-Romero, J. C., González-Ríos, H., Borges, A., and Simões, M., 2015, Antibacterial Effects and Mode of Action of Selected Essential Oils Components against Escherichia coli and Staphylococcus aureus. *Evid. Based Complementary Altern. Med.*, 1-9.

Lorencini, M., Silva, J. A. F., Hoz, C. L. R., Carvalho, H. F., StachMachado, D. R., 2009, Changes in MMPs and inflammatory cells in experimental gingivitis, *Histol. Histopathol.*, 24:157-166.

Lota, M., Rocca, D.E., Tomi, A.L.F, Jacquemond, C, Casanova, J., 2002, Volatile components of peel and leaf oils of lemon and lime species, *J.Agric. Food Chem*., 50(4):796-805.

Mai-Prochnow A., Clauson M., Hong J., Murphy A.B., 2016, Gram positive and Gram negative bacteria differ in their sensitivity to cold plasma, *Sci. Rep.*, 6.

Manipal, S., Hussain, S., Wadgave, U., Duraiswamy, P. and Ravi, K., 2016, The mouthwash war - Chlorhexidine vs. herbal mouth rinses: A meta-analysis, *J. Clin. Diag. Res.*, 10(5):ZC81–ZC83.

Mann, J., Bernstein, Y. and Findler, M., 2020, Periodontal disease and its prevention, by traditional and new avenues (Review), *Exp. Ther. Med.*, 19:1504–1506.

Mason, T.G., Wilking, J.N., Meleson, K., Chang, C.B., Graves, S.M., 2006, Nanoemulsions: Formation, Structure, and Physical Properties, *J. Phys*: *Condens*, 18:635–666.

Matinlinna, J.P., 2015, *Handbook of oral biomaterials*, Matinlinna JP, ed., Pan Sanford Publishing, New York.

Mathurasai, W., Thanyasrisung, P., Sooampon, S., and Ayuthaya, B. I. N., 2019, Hydrogen peroxide masks the bitterness of chlorhexidine mouthwash without affecting its antibacterial activity, *J. Indian Soc. Periodontol.*, 23(2):119–123.

McClements, D.J., 2007, Critical review of techniques and methodologies for characterization of emulsion stability. *Critical Reviews in Food Sci. and Nutrition*, 47(7):611–649.

Melo, M.S., Guimarães, A.G., Santana, M.F., Siqueira, R.S., De Lima, A.D.C.B., Dias, A.S., et.al., 2011, Anti-inflammatory and redox-protective activities of citronellal, *Biol. Res.*, 44(4):363-368.

UNIVERSITAS GADJAH MADA
Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai Obat Kumur Pada Pencegahan Gingivitis Kehamilan
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Mescher, A.L., 2011, Histologi Dasar Junqueira Teks dan Atlas.12th ed., Terj.: Dany, F., EGC, p. 201-202, 309-316.

Miyake, Y. and Hiramitsu, M., 2011, Isolation and extraction of antimicrobial substances against oral bacteria from lemon peel, *J. Food Sci. Technol.*, 48(5):635–639.

Mohanapriya, M., Ramaswamy, L. and Rajendran, R., 2013, Health and Medicinal Properties of Lemon (Citrus limonum), *Int. J. Ayur. Herb. Med.*, 3(1):1095–1100.

Moosavy, M.H., Hassanzadeh, P., Mohammadzadeh, E., Mahmoudi, R., Khatibi, S.A. and Mardani, K., 2017, Antioxidant and Antimicrobial Activities of Essential Oil of Lemon (Citrus limon) Peel *in vitro* and in a Food Model, *J. Food Qual. Hazards Control*, 4:42–48.

Müller, H. D., Eick, S., Moritz, A., Lussi, A., and Gruber, R., 2017, Cytotoxicity and Antimicrobial Activity of Oral Rinses In vitro, *Biomed. Res. Int.*, 4019723.

Mulyanti, S., Laela, D.S., Julaeha, E., Suwargiani, A.A. and Aripin, D., 2020, Formulation of mouth rinse from the essential oils of lime (Citrus aurantifolia) and its inhibitory efficacy on the growth of Streptococcus mutans – *in vitro*, *Padjadjaran J. Dent.*, 32(1):39–47.

Muttalib, S.A., Edros, R., Azah, N. and Kutty, R. v, 2018, A Review: The extraction of active compound from Cymbopogon sp. and its potential for medicinal applications, *Inter. J. Eng. Tech. Sci.*, 5(1):82–98.

Muzaffar, F., Singh, U. K., Chauhan, L., 2013, Review on microemulsion as futuristic drug delivery. *Int. J. Pharm. Pharm. Sci*., 5(3):39–53.

Nafea, J., Edbeib, M., Notarte, K.I., Huyop, F. and Yaakub, H., 2020, Stability and antibacterial property of polyherbal mouthwash formulated using local ingredients, *Biosaintifika: J.Biol and Biol. Educ.*, 12(3):288–296.

Nazir, M.A., 2017, Prevalence of periodontal disease, its association with systemic diseases and prevention., *Inter. J. Health Sci.*, 1(2):72–80.

Newman, M. G., Takei, H. H., Carranza, F. A., 2019, Newman and Carranza's Clinical Periodontology, Ed. 13, Elsevier, Philadephia.

Nokhbatolfoghahaei, H., Paknejad, Z., Bohlouli, M., Rezai Rad, M. and Khojasteh, A., 2020, Animal Models in Dental Research, In, *Applications of Biomedical Engineering in Dentistry*, Springer International Publishing, pp: 377–442.

Ocheng, F., Bwanga, F., Almer Boström, E., Joloba, M., Borg-Karlson, A.K., Yucel-Lindberg, T., Obua, C. and Gustafsson, A., 2016, Essential Oils from

UNIVERSITAS GADJAH MADA
Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai Obat Kumur Pada Pencegahan Gingivitis Kehamilan
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Ugandan Medicinal Plants: *In vitro* Cytotoxicity and Effects on IL-1 β-Induced Proinflammatory Mediators by Human Gingival Fibroblasts, *Evidence-Based Compl. Altern. Med.*, 1–8.

Olejnik, E. and Szymanska, J., 2020, Active ingredients of mouthwashes, *Acta Pol. Pharm. Drug Research*, 77(6):825–832.

Oral Health Care During Pregnancy Expert Workgroup, 2012, *Oral Health Care During Pregnancy: A National Consensus Statement*, Washington.

Ouédraogo, G.G., Sawadogo, I., Koussé, J.N.D., Ilboudo, S., Tounkara, B., Ouédraogo, M., Nébié, R.C.H. and Ouédraogo, S., 2020, Assessment of Oral Toxicity, Skin and Eye Irritation of Cymbopogon Winterianus (L.) Rendel (Poaceae) Essential Oil from Burkina Faso, *Int. J. Adv. Res*, 8(7):1617–1626.

Oz, H.S. and Puleo, D.A., 2011, Animal Models for Periodontal Disease, *J. Biomedicine Biotechnol.*, 1–8.

Parashar, A., 2015, Mouthwashes and Their Use in Different Oral Conditions, *Sch. J. Dent. Sci.*, 2(2B):186–191.

Park, B. B., An, J. Y., Park, S. U., 2021, Recent studies on pinene and its biological and pharmacological activities. *EXCLI J.*, *20*:812–818.

Pörtner, Ralf., 2007, *Animal cell biotechnology : methods and protocols*, 2nd ed., Humana Press , New Jersey, pp:205-222

Prabajati, R., Hernawan, I. and Hendarti, H.T., 2017, Effects of citrus limon essential oil (Citrus limon L.) on cytomorphometric changes of Candida albicans, *Dent. J.* , 50(1):43–48.

Prasanna, S.G.V., and Lakshmanan, R., 2016, Characteristics, Uses and Side effects of Chlorhexidine-A Review, *IOSR J. Dent. Med. Sci.*, 15(6):57–59.

Preethanath, R.S., Ibraheem, W.I., Anil, A., 2020, Pathogenesis of gingivitis oral diseases. Intech Open, http://dx.doi.org/10.5772/intechopen.91614

Preeti, S.S., Malik, R., Bhatia, S., Al Harrasi, A., Rani, C., Saharan, R., Kumar, S., Geeta, Sehrawat, R., 2023, Nanoemulsion: An Emerging Novel Technology for Improving the Bioavailability of Drugs, *Scientifica*, 6640103

Ramalho, T. R., Oliveira, M. T., Lima, A. L., Bezerra-Santos, C. R., Piuvezam, M. R., 2015, Gamma-Terpinene Modulates Acute Inflammatory Response in Mice. *Planta Med.*, 81(14):1248–1254.

Rao, N.J., Subash, K.R. and Kumar, K.S., 2012, Role of phytotherapy in gingivitis: A review, *Int. J. Pharmacol.*, 8(1):1–5.

UNIVERSITAS
GADJAH MADA
**Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan**
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Rivas da Silva, A. C., Lopes, P. M., Barros de Azevedo, M. M., Costa, D. C., Alviano, C. S., Alviano, D. S., 2012, Biological activities of α-pinene and β-pinene enantiomers, *Molecules,*17(6):6305–6316.

Qodri, U.L., 2020, Quantitative analysis of essential oil from Lemongrass (Cymbopogon sp) as aromaterapy, *J. Farm. Tinctura,* 1(2): 64-70

Rahayu, D. P., Draheim, R., Lalatsa, A., Roldo, M., 2022., Harnessing the antibacterial properties of fluoridated chitosan polymers against oral biofilms. *Pharmaceutics,* 14(3):488.

Rahman, F.A., Sunarintyas, S., Martien, R., Syaify, A., 2023, Gingival inflammation induction in pregnant Sprague-Dawley rats: A pilot study, *BIO Web of Conferences,* 75(02003):1-4.

Rathee M., Jain P., 2023, Gingivitis, In: StatPearls. Treasure Island (FL): StatPearls Publishing, https://www.ncbi.nlm.nih.gov/books/NBK557422/

Reddy, H.T. and Preethi, 2020, Herbal Mouthwashes, *Eur. J. Mol. Clin. Med.*, 7(2):6655–6661.

Reyes, L., Phillips, P., Wolfe, B., Golos, T.G., Walkenhorst, M., Progulske-Fox, A. and Brown, M., 2017, Porphyromonas gingivalis and adverse pregnancy outcome, *J. Oral Microbiol.*, 9(1):1374153.

Rowey, R. C., Sheskey, P .J., & Owen, S. C., 2006, Handbook of Pharmaceutical Excipients Fifth Edition. London : Pharmaceutical Press. pp: 1-3, 295-298, 657-658, 662-664, 744-747, 785-787

Sakaguchi, R.L. and Powers, J.M., 2012, *Craig 's Restorative Dental Materials*, *13th ed.*,

Sandri, G., Bonferoni, M.C., Ferrari, F., Rossi, S., Caramella, C.M., 2014, The role of particle size in drug release and absorption., In: Merkus Henk G. and Meesters GMH, editor. *Particulate Products: Tailoring Properties for Optimal Performance*, Cham: Springer International Publishing, pp:323–341.

Santos, E. S., Abrantes Coelho, G. L., Saraiva Fontes Loula, Y. K., Saraiva Landim, B. L., Fernandes Lima, C. N., Tavares de Sousa Machado, S., Pereira Lopes, M. J., Soares Gomes, A. D., Martins da Costa, J. G., Alencar de Menezes, I. R., Coutinho, H. D. M., Kim, B., Bezerra Felipe, C. F., de Araújo Neves, S., Kerntopf, M. R., 2022, Hypoglycemic, Hypolipidemic, and Anti-Inflammatory Effects of Beta-Pinene in Diabetic Rats, *Evid. Based Complement Alternat. Med*., 8173307.

UNIVERSITAS GADJAH MADA
Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai Obat Kumur Pada Pencegahan Gingivitis Kehamilan
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Sanz, M. and Kornman, K., 2013, Periodontitis and adverse pregnancy outcomes: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases, *J. Clin. Periodontol.*, 40(14):S164–S169.

Scott, D. A., and Krauss, J., 2012, Neutrophils in periodontal inflammation, *Front. Oral Biol.*, 15:56–83

Shah, P., Bhalodia, D., Shelat, P., 2010, Nanoemulsion: A Pharmaceutical Review, *Sys. Rev. Pharm.,* 1(1): 24-32.

Sitholimela, C.S. and Shangase, L.S., 2013, The association between periodontitis and pre-term birth and/or low birth weight: a literature review., *SADJ*, 68(4): 1–9.

Soekanto, S. A., Zhafira, A., Kalemben, E., Theodorea, C. F., Bachtiar, E. W., Bachtiar, B. M., 2023, Effect of propolis mouthwash on growth and sensitivity of dual-species Porphyromonas gingivalis and Staphylococcus aureus biofilms (*In vitro*), *J. Int. Dent. Med. Res.*,16(3):1010-1013.

Solans, C., Izquierdo, P., Nolla, J., Azemar, N., Garcia-Celma, M.., 2005, Nanoemulsions, *Curr. Opin. Colloid Interface Sci.* 10(3):102–110.

Soulissa, A.G., 2014. Hubungan kehamilan dan penyakit periodontal (Relationship between pregnancy and periodontal disease). *Jurnal PDGI*, 63(3), pp. 71–77.

Struillou, X., Boutigny, H., Soueidan, A. and Layrolle, P., 2010, Experimental Animal Models in Periodontology: A Review, *Open Dent. J.*, 4(1):37–47.

Subramanian, P., Takwa, C.W.I.C.W. and Zubair, N.E.A., 2015, Chemical Composition and Antibacterial Activity of Essential Oil of Cymbopogon citratus and Cymbopogon winterianus against Enterococcus faecalis, *Int. J. Biosci.*, 6(9):9–17.

Sulaswatty, A., Rusli, M. S., Abimanyu, H., dan Tursiloadi, S., 2019, *Quo Vadis Minyak Serai Wangi dan Produk Turunannya*. In LIPI Press, Jakarta.

Sun, Y., Guo, Q.M., Liu, D.L., Zhang, M.Z. and Shu, R., 2010, *In vivo* expression of Toll-like receptor 2, Toll-like receptor 4, CSF2 and LY64 in Chinese chronic periodontitis patients, *Oral Dis.*, 16(4):343–350.

Suryono, S., Hasmy, N. S., Pertiwi, T. L., Benyamin, B., 2017, Propolis 10%-Gel as a Topical Drug Candidate on Gingivitis. *I. J. Med. Pharm.*, 5(1):12–17.

Syukur, C., dan Trisilawati, O., 2019, *Sirkuler Informasi Teknologi Tannaman Rempah dan Obat: Varietas Unggul Seraiwangi, Teknologi Budidaya dan Pasca Panen*, Balai Penelitian Tanaman Rempah dan Obat, Jakarta.

UNIVERSITAS
GADJAH MADA
**Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan**
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Tedjosasongko, U., Anggraeni, F., Wen, M.L., Kuntari, S. dan Puteri, M.M., 2019, Prevalence of caries and periodontal disease among Indonesian pregnant women, *Pesqui. Bras. em Odontopediatria Clin. Integr.*, 19(e45SS):1–8.

Tjahyono, N., Parmadianti, A.E. dan Mahdani, F.Y., 2017, Cytotoxicity Test of Citrus Limon Peel Essential Oil in Human Gingival Fibroblast, *Oral Med. Dent J.*, 9(1):53–60.

Usin, M.M., Tabares, S.M., Parodi, R.J. and Sembaj, A., 2013, Periodontal conditions during the pregnancy associated with periodontal pathogens., *J. Invest. Clin. Dent.*, 4:54–59.

Uwambaye, P., Munyanshongore, C., Rulisa, S., Shiau, H., Nuhu, A. and Kerr, M.S., 2021, Assessing the association between periodontitis and premature birth: a case-control study, *BMC Pregnancy Childb.* , 21(204):1–9.

Van Leeuwen, M. P., Slot, D. E., and Van der Weijden, G. A., 2011, Essential oils compared to chlorhexidine with respect to plaque and parameters of gingival inflammation: a systematic review, *J. Periodontol.*, 82(2):174–194.

Vranic, E., Lacevic, A., Mehmedagi, A. and Uzunovi, A., 2004, Formulation Ingredients for Toothpastes and Mouthwashes, *Bos. J. Basic Med. Sci.*, 4(4):51–58.

van der Weijden, F.A., van der Sluijs, E., Ciancio, S.G. and Slot, D.E., 2015, Can Chemical Mouthwash Agents Achieve Plaque/Gingivitis Control?, *Dent. Clin. North Am.*, 59(4):799–829.

Vimal M., Vijaya P.P., Mumtaj P., Farhath M.S.S., 2013, Antibacterial activity of selected compounds of essential oils from indigenous plants, *J. Chem. Pharm. Res*., 5(1):248–253.

Walkenhorst, M.S., Reyes, L., Perez, G., Progulske-Fox, A., Brown, M.B., Phillips, P.L., 2020, A uniquely altered oral microbiome composition was observed in pregnant rats with porphyromonas gingivalis induced periodontal disease, *Front. Cell. Infect. Microbiolol*.,10(92):1–10.

Wang, J., Su, B., Zhu, H., Chen, C., and Zhao, G., 2016, Protective effect of geraniol inhibits inflammatory response, oxidative stress and apoptosis in traumatic injury of the spinal cord through modulation of NF-κB and p38 MAPK, *Exp. Ther. Med.*, 12(6):3607–3613.

Wang, Y., Fan, Q., Xu, Y., Zeng, F., Liu, X., Zhao, D., Zhang, L., Bai, G., 2022, Effect of Eucommia water extract on gingivitis and periodontitis in experimental rats. *BMC oral health*, 22(1):326.

UNIVERSITAS
GADJAH MADA
**Kajian Kombinasi Minyak Serai Wangi (Cymbopogon winterianus) dan Minyak Lemon (Citrus limon) Sebagai
Obat Kumur Pada Pencegahan Gingivitis Kehamilan**
FRISKA ANI RAHMAN, Prof. Dr. drg. Siti Sunarintyas, M.Kes. ; Dr. drg. Ahmad Syaify, Sp.Perio.(K) ; Dr. rer nat. Ron
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Wiegand, I., Hilpert, K., and Hancock, R. E., 2008, Agar and broth dilution methods to examine the minimal inhibitory concentration (MIC) of antimicrobial substances. *Nature protocols*, 3(2):163–175.

Wilkins, E.M., Wyche, C.J. and Boyd, L.D., 2015, *Clinical practice of the dental hygienist*, 12th ed.

Wu, M., Chen, S.W. and Jiang, S.Y., 2015, Relationship between gingival inflammation and pregnancy, *Mediators Inflamm.*, 1–11.

Wu, M., Chen, S.W., Su, W.L., Zhu, H.Y., Ouyang, S.Y., Cao, Y.T. and Jiang, S.Y., 2016, Sex hormones enhance gingival inflammation without affecting il-1 β and TNF- in periodontally healthy women during pregnancy, *Mediators Inflamm.*, 1–6.

Yayli, N. Z.A., Tunc, S. K., Degirmenci, B. U., Dikilitas, A., and Taspinar, M., 2021, Comparative evaluation of the cytotoxic effects of different oral antiseptics: A primary culture study, *Niger. J. Clin. Pract.*, 24(3):313–320.

Yucel-Lindberg, T., and Båge, T., 2013, Inflammatory mediators in the pathogenesis of periodontitis. *Expert Rev. Mol. Med.*, 15:e7

Zhu, B., Macleod, L.C., Kitten, T. and Xu, P., 2018, Streptococcus sanguinis biofilm formation and interaction with oral pathogens, *Future Microbiol.*, 13(8):915–932.