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DAFTAR PUSTAKA

Adaigbe, V.C., J.A. Odebiyi, A.A. Omoloye, C.I. Aisagbonhi & O. Iyare. 2014. Host location and ovipositional preference of *Elaeidobius kamerunicus* on four host palm species. International Journal of Agroforestry and Silviculture. 1 (2): 022-024.

Adam, H., S. Jouannic, J. Escoute, Y. Duval, J.L. Verdeil & J.W. Tregear. 2005. Reproductive developmental complexity in African oil palm (*Elaeis guineensis*, Arecaceae). Annals of Botany. 92(11): 1836-1852.

Adam, H., M. Collin, F. Richaud, T. Beule, D. Cros, A. Omore, L. Nodichao, B. Nouy & J.W. Tregear. 2011. Environmental regulation of sex determination in oil palm: current knowledge and insights from other species. Ann. Bot. 108: 1529–1537. doi: 10.1093/aob/mcr151.

Afandi, D., A. Qurbi, C. Enthoven, I. Syahputra, E. Surya, M.I. Dompu, C.A. Pasha & N. Ulfa. 2023. Additional pollination with hatch and carry mobile technology on high-yielding oil palm planting materials. Proceeding of PIPOC 2023, 7-9 November 2023. Malaysian Palm Oli Board.

Afrian, D., W. Windriyanti & S. Wiyatiningsih. 2020. Perilaku polinator *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) pada pembungaaan kelapa sawit (*Elaeis guineensis* Jacq.). Plumula: Berkala Ilmiah Agroteknologi 8(2): 56-66.

Agustira, M.A., R. Amalia dan R. Nurkhoiry. 2015. Program sawit untuk rakyat (PROWITRA) sebagai upaya peningkatan produktivitas, pemberdayaan, keberlanjutan, dan kesejahteraan pekebun kelapa sawit rakyat. Membangun Daya Tahan Pertanian dalam Rangka Pemberdayaan Petani dan Perlindungan Pertanian. Hal 315-324.

Ahmad, M.N., S.R.A. Ali, M.M.M. Masri & M.W. Basri. 2009. Effect of *Bacillus thuringiensis*, Terakil-1® and Teracon-1® against oil palm pollinator, *Elaeidobius kamerunicus* and beneficial insects associated with *Cassia cobanensis*. Journal of Oil Palm Research. 21 (2): 667 – 674.

Ahmad, M.N., S.R.A. Ali, M.M.M. Masri & M.W. Basri. 2012. Effect of Bt products, LEPCON- 1, BAFOG-1 (S) and ECOBAC-1 (EC), against the oil palm pollinating weevil, *Elaeidobius kamerunicus*, and beneficial insects associated with *Cassia cobanensis*. Journal of Oil Palm Research. 24:1442–1447.

Aisagbonhi, A.I., N. Kamarudin, C.O. Okwuagwu, M.W. Basri, T. Jackson & V. Adaigbe. 2004. Preliminary observations on a field population of the oil palm-pollinating weevil *Elaeidobius kamerunicus* in Benin City, Nigeria. International Journal of Tropical Insect Science. 24 (3): 255–259. DOI: 10.1079/IJT200431.

Allen, R.G., L.S. Pereira, D. Raes & M. Smith. 1998. Crop evapotranspiration – Guidelines for computing crop water requirements – FAO Irrigation and drainage paper 56. FAO, Rome.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Alves, F.E., R. Brito, T. Rodrigues, L. Silva, E. de Brito, K. Canuto, C Krug & G. Zicolo. 2019. Different species of oil palm with the metabolic profiling of volatile organic compounds. Chemistry and Biodiversity. 16 (6): DOI: 10.1002/cbdv.201900050.

Amin, M.F. 2016. Variasi DNA mitokondria kumbang penyerbuk kelapa sawit *Elaeidobius kamerunicus* (Faust, 1898) (Coleoptera: Curculionidae) asal Jambi dan Jawa Barat. Skripsi. Institut Pertanian Bogor. Bogor. 18p.

Anreiter, I. & M.B. Sokolowski. 2019. The foraging gene and its behavoral effect: pleitropy and plasticity. Annual Review of Genetics. 53: 373v-v392. https://doi.org/10.1146/annurev-genet-112618-043536.

Anggraeni, T., S. Rahayu, I. Ahmad, R.R. Esyanti & R.E. Putra. 2013. Resources partitioning and different foraging behavior is the basis for the coexistence of *Thrips hawaiiensis* (Thysanoptera: Tripidae) and *Elaeidobius kamerunicus* (Coleoptera: Curculionidae) on oil palm (*Elaeis guineensis* Jacq) flower. J. Entomol. Nematol. 5 (5): 59-63. DOI: 10.5897/JEN12.008.

Appiah, S.O. & D. Agyei. 2013. Studies on Entomophil pollination towards sustainable production and increased profitability in the oil palm: a review. Elixir Agriculture. 55: 12878-12883.

Apriyanto, A. and V.B. Tambunan. 2021a. Draft genome sequence, annotation, and SSR mining data of *Elaeidobius kamerunicus* Faust., an essential oil palm pollinating weevil. Data in Brief. 34 (2021): 106745. https://doi.org/10.1016/j.dib.2021.106745.

Apriyanto, A. and V.B. Tambunan. 2021b. The complete mitochondrial genome of oil palm pollinating weevil, *Elaeidobius kamerunicus* Faust. (Coleoptera: Curculionidae). Mitocondrial DNA Part B. 5 (3): 3432–3434. https://doi.org/10.1080/23802359.2020.1823899.

Arianto, I.W., A.E. Prasetyo, A. Susanto & Riyanto. 2013. Peranan *Elaeidobius kamerunicus* dalam peningkatan *fruit set* kelapa sawit. Prosiding Pertemuan Teknis Kelapa Sawit 7-9 Mei 2013, Jakarta.

Ashman, T.L. 2009. Sniffing out patterns of sexual dimorphism in floral scent. Functional Ecology. 23: 852–862.

Asmawati, Ahmad & Kafrawi. 2019. Populasi kumbang penyerbuk *Elaeidobius kamerunicus* Faust. pada tanaman kelapa sawit (*Elaeis guineensis* Jacq). J. Agroplantae. 8 (2): 33-41.

Auffray, T., B. Fre´rot, R. Poveda, C. Louise & L. Beaudoin-Ollivier. 2017. Diel Patterns of Activity for Insect Pollinators of Two Oil Palm Species (Arecales: Arecaceae). Journal of Insect Science. 17 (2): 45; 1–6. doi: 10.1093/jisesa/iex018.

Azmi, W.A., S.N. Daud, M.H. Hussain, Y.K. Wai, Z. Chik & A.S. Sajap. 2014. Field trapping of adult red palm weevil *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curcilionidae) with food baits and synthetic pheromone lure in a coconut plantation. The Philippine Agricultural Scientist 97(4): 409-415.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Badan Pengelola Dana Perkebunan Kelapa Sawit [BPDPKS]. 2020. Industri Sawit Topang Devisa Negara. https://republika.co.id/berita/qiqso9370/industri-sawit-topang-devisa-negara. (diakses 21 Desember 2020).

Bakara, R.D.J., D. Buchori, R.Y.M. Kusumah, B. Sahari & A. Apriyanto. 2018. Genetic diversity of *Elaeidobius kamerunicus* Faust. (Coleoptera: Curculionidae) across geographic areas in Indonesia: implications for oil palm sustainability. IOP Conf. Series: Earth and Environmental Science. 325: 012003. doi:10.1088/1755-1315/325/1/012003.

Bakara, R.D.J., V.B. Tambunan, A. Apriyanto , Y.M. Kusumah, B. Sahari & D. Buchori. 2020. Genetic diversity and population structure in *Elaeidobius kamerunicus* (Coleoptera: Curculionidae) inferred from mtDNA COI and microsatellite markers. Advances in Biological Sciences Research. 8: 273-284.

Barcelos, E., S.A. Rios, R.N.V. Cunha, R. Lopes, S.Y. Motoike, E. Babiychuk, A. Skirycz & S. Kushnir. 2015. Oil palm natural diversity and the potential for yield improvement. Front. Plant Sci. 6: 190. doi: 10.3389/fpls.2015.00190.

Barfod, A.S., M. Hagen & F. Borchsenius. 2011. Twenty-five years of progress in understanding pollination mechanisms in palms (Arecaceae). Annals of Botany. 108: 1503–1516. doi:10.1093/aob/mcr192.

Bazurto, L.G.M., L.Á. Sánchez, F. Prada, E.S. Daza, A.E. Bustillo & H.M. Romero. 2018. Relationships Between Inflorescences and Pollinators and Their Effects on Bunch Components in *Elaeis guineensis*, in Colombia. J. Entomol. Sci. 53 (4): 554-568. https://doi.org/10.18474/JES18-06.1.

Basri, M.W. & K. Norman. 1997. Role and effectiveness of *Elaeidobius kamerunicus*, *Thrips hawaiiensis* and *Pyroderces* sp. in pollination of mature oil palm in Peninsular Malaysia. Elaeis. 9 (1): 1-16.

Basri, M.W. 1984. Developments of the oil palm pollinator *Elaeidobius kamerunicus* in Malaysia. Palm Oil Developments. 2: 1-3.

Bazurto, L.G.M., L.Á. Sánchez, F. Prada, E.S. Daza, A.E. Bustillo & H.M. Romero. 2018. Relationships Between Inflorescences and Pollinators and Their Effects on Bunch Components in *Elaeis guineensis*, in Colombia. J. Entomol. Sci. 53 (4): 554-568. https://doi.org/10.18474/JES18-06.1.

Beaudoin-Ollivier, L., A. Flori, I. Syahputra, L. Syahputra, C. Nodichao & A. Louise. 2017. Study of *Elaeidobius* spp. and *Grasidius hybridus* population activity (Coleoptera: Curculionidae) using a new trapping method during oil palm anthesis. Bulletin de la Socie´te´ Entomologique de France. 122 (2): 151-160.

Bettycopa, A., A.T. Andrew, H. Khalid, H. Mohd-Haniff & K. Norman. 2015. The diet of the yellow-vented bulbul (*Pycnonotus goiavier*) in oil palm agroecosystems. Journal of Oil Palm Research. 27 (4): 417-424.

Bonneau, L., D. Eli, P. Vovola & D.S. Virk. 2017. Comparing pollination bag types for micro-environmental parameters influencing seed production in oil palm. Journal of Oil Palm Research. 29 (2): 168-179. DOI: https://doi.org/10.21894/jopr.2017.2902.02.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Bournier, J.D. 1983. A polyphagous insect *Thrips palmi* (Karny), important cotton pest in the Philippines. Cotton Fibres Tropical. 38: 288-289.

Bruce, T.J. & J.A. Pickett. 2011. Perception of plant volatile blends by herbivorous insects-finding the right mix. Phytochemistry. 72 (13): 1605–11.

Buchori, D., Nurindah, R. Raffiudin, Novrinelly, Yaherwandi, E. Martono, A. Rizali, W. Nurdin & P. Syahierah. 2017. 40 years of entomological research in Indonesia. Entomological Society of Indonesia. Bogor.

Bujan, J., S. P. Yanoviak & M. Kaspari. 2016. Desiccation resistance in tropical insects: causes and mechanisms underlying variability in a Panama ant community. Ecology and Evolution 6(7): 6282-6291. https://doi.org/10.1002/ece3.2355.

Caudwell, R.W., D. Hunt, A. Reid B.A. Mensah & C Chinchilla. 2003. Insect pollination of oil palm – a comparison of the long-term viability and sustainability of *Elaeidobius kamerunicus* in Papua New Guinea, Indonesia, Costa Rica, and Ghana. ASD Oil Palm Papers (Costa Rica). 25: 1-16.

Chinchilla-López, C.M. & D.L. Richardson. 1991. Pollinating insects and the pollination of oil palms in Central America. ASD Tech. Bull. 1–18.

Claudia, D., A.C. Keyel, J. Salecker, Y. Kisel, K.M. Meyer, M. Auliya, A.D. Barnes, M.D. Corre, K. Darras, H. Faust, B. Hess, S. Klasen, A. Knohl, H. Kreft, A. Meijide, F. Nurdiansyah, F. Otten, G. Pe'er, S. Steinebach, S. Tarigan, M. Tölle, T. Tscharntke & K. Wiegand. 2016. A review of the ecosystem functions in oil palm plantations, using forests as a reference system. *Biol. Rev.* pp. 000–000. doi: 10.1111/brv.12295.

Combres, J.C., B. Pallas, L. Rouan, I.M. Serra, J.P. Caliman, S. Braconnier, J.C. Soulié & M. Dingkuhn. 2013. Simulation of inflorescence dynamics in oil palm and estimation of environment-sensitive phenological phases: a model based analysis. Functional Plant Biology. 40: 263–279. http://dx.doi.org/10.1071/FP12133.

Corrales, C.A.S., N.F.U. Morales, J.D.C. Martinez, A.E. Bustillo & A.M. Rodríguez. 2024. Biology and behaviour of *Elaeidobius kamerunicus* Faust, 1898 (Coleoptera: Curculionidae) in two oil palm cultivars in Colombia. Journal of Oil Palm Research 36(4): 586-597. DOI: https://doi.org/10.21894/jopr.2023.0048.

Corley, R.H.V. & P.B. Tinker. 2016. The Oil Palm (5th edition). New York: John Wiley & Son. http://dx.doi.org/10.1002/9781118953297.

de Chenon, R.D. 2016. Keynote speech: the current and future challenges of pests, disease, weeds and biodiversity in oil palm. Proceeding of Sixth IOPRI-MPOB International Seminar of Pests and Diseases, Medan, Indonesia.

de Chenon, R.D. & A. Susanto. 2006. Ecological observations on the diurnal birds in Indonesian oil palm plantations. Journal of Oil Palm Research, special issue, 122-143.

de Chenon, R.D. 1982. Entomophil pollination of oil palm in West Africa - preliminary research. The Oil Palm in the Eighties. A Report of the Proceedings of the

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

International Conference on Oil Palm in Agriculture in the Eighties Held in Kuala Lumpur from 17-20 June 1981. Volume I. Presented at the The International Conference on Oil Palm in Agriculture in the Eighties in Kuala Lumpur from 17-20 June 1981, Incorporated Society of Planters 291–319.

Dhileepan, K. 1994. Variation in populations of the introduced pollinating weevil (*Elaeidobius kamerunicus*) (Coleoptera: Curculionidae) and its impact on fruit set of oil palm (*Elaeis guineensis*) in India. Bull. Ent. Res. 84: 477-485.

Direktorat Jenderal Perkebunan [Ditjenbun]. 2025. Statistik Perkebunan Indonesia 2023-2025, Volume I. Jakarta: Ditjenbun, Kementerian Pertanian RI. 1.134p.

Donough, C.R. & I.H. Law. 1987. The Effect of Weevil Pollination on Yield and Profitability at Pamol Plantation. Proceeding of International Oil Palm Conference. Kuala Lumpur, Malaysia.

Dumont, Y., J.C. Soulie & F. Michel. 2018. Modelling oil palm pollinator dynamics using deterministic and agent-based approaches. Applications on fruit set estimates. Some preliminary results. Math. Meth. Appl. Sci. 2018: 1–20. DOI: 10.1002/mma.4858.

Durand-Gasselin, T., J.M. Noiret, R.K. Kouame, B. Cochard & B. Adon. 1999. Availability of quality pollen for improved oil palm (*Elaeis guineensis* Jacq.) seed production. Plantations, Recherche, De´veloppement. 6: 264 – 276.

Dzulhelmi, M.N., M. Nur-Syahirah, A.M. Nabeel Ata, O.A. Meilina, A.L. Fatihah, ABD Latip, S. Suriyanti & R.H. Izfa. 2020. Morphometric analysis of the oil palm pollinating weevil, *Elaeidobius kamerunicus* (Faust, 1878) (Coleoptera: Curculionidae) from oil palm plantations in Malaysia. J. Entomol. Res. Soc., 22(3): 275-291, 2020.

Euler, M., M.P. Hoffmann, Z. Fathoni & S. Schwarze. 2016. Exploring yield gaps in smallholder oil palm production systems in eastern Sumatra, Indonesia. Agric. Syst. 146: 111–119. https://doi.org/10.1016/j.agsy.2016.04.007.

Ezzaty, N.F., S.N. Ahmad, I.R. Hazmi, M.M.M. Mohd Masri & J. Jalinas. 2024. Assessment of parasitic nematodes *Elaeolenchus parthenonema* poinar, on pollinating weevil, *Elaeidobius kamerunicus* at selected oil palm plantations in Pahang, Malaysia. Journal of Oil Palm Research. Article in Press. DOI: https://doi.org/10.21894/jopr.2024.0027.

Fahmi, M.H.M., A.K. Ahmad Bukhary, H. Norma & A.B. Idris. 2016. Analysis of volatile organic compound from *Elaeis guineensis* inflorescences planted on different soil types in Malaysia. AIP Conference Proceedings. 1784: 060020. doi: 10.1063/1.4966858.

Food and Agriculture Organization [FAO]. 2025. Meteorolical Data, Chapter III. https://www.fao.org/4/x0490e/x0490e07.htm. Diakses pada 19 Oktober 2025.

Faizal, I. & A. Emdi. 2017. Analysis of flowering gene in palm oil (*Elaeis guineensis*). Asian Journal of Agriculture. 1 (2): 53-58. DOI: 10.13057/asianjagric/g010201.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Fatihah, N.A.L., M.M.H, Fahmi, H.A. Luqman, S.S.M.D. Nadiah, T.M. Teo, I.H. Riza & A.B. Idris. 2019a. Effects of rainfall, number of male inflorescences and spikelets on the population abundance of *Elaeidobius kamerunicus* (Coleoptera: Curculionidae). Sains Malaysiana. 48 (1): 15–21. http://dx.doi.org/10.17576/jsm-2019-4801-03.

Fatihah, N.A.L., A.G. Idris, I.R. Hazmi, C.M.Z.A. Rizuan, D. Sartiami, S. Yacob & M.N. Dzulhelmi. 2019b. Morphometric Comparison of the Oil Palm Pollinator *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) from Malaysia, Indonesia, and Liberia. The Coleopterists Bulletin. 73 (3): 746-756. URL: https://doi.org/10.1649/0010-065X-73.3.746.

Fijen, T.P.M., J.A. Scheper, T.M. Boom, N. Janssen, I. Raemakers & D. Kleijn. 2018. Insect pollination is at least as important for marketable crop yield as plant quality in a seed crop. Ecol. Lett. 21: 1704–1713. https://doi.org/10.1111/ele.13150.

Folmer, O., M. Black, W. Hoeh, R. Lutz & R. Vrijenhoek. 1994. DNA primers for amplification of mitochondrial cyto-chrome c oxidase subunit I from diverse metazoan invertebrates. Mol. Mar. Biol. Biotechnol. 3: 294–299.

Foster, W.A., J.L. Snaddon, E.C. Turner, T.M. Fayle, T.D. Cockerill, M.D.F. Ellwood, G.R. Broad, A.Y.C. Chung, P. Eggleton, C.V. Khen & K.M. Yusah. 2011. Establishing the evidence base for maintaining biodiversity and ecosystem function in the oil palm landscapes of South East Asia. Philosophical Transactions of the Royal Society B-Biological Sciences. 366: 3277–3291.

Franz, N. & R.M. Valente. 2006. Evolutionary trends in derelomine flower weevils (Coleoptera: Curculionidae): from associations to homology. Invertebrate Systematics. 19(6): 499–530.

Gabungan Pengusaha Kelapa Sawit [GAPKI]. 2024. Wah Sekali! 600 Triliun Devisa Sawit Untuk Indonesia. https://gapki.id/news/2024/04/13/wah-sekali-600-triliun-devisa-sawit-untuk-indonesia/. Diakses 21 September 2025.

Glastad, K.M., B.G. Hunt & M.A.D. Goodisman. 2019. Epigenetics in insects: genome regulation and the generation of phenotypic diversity. Annu. Rev. Entomol. 64: 185-203. https://doi.org/10.1146/annurev-ento-011118-111914.

Genty, P., A. Garzon, F. Lucchini & G. Delvare. 1986. Entomophilous pollination of the Oil Palm in Tropical America. Oleagineux 41, 99–112.

Gintoron, C.S., M.A. Mohammed, S.N. Sazali, E.Q. Deka, K.H. Ong, I.H. Shamsi & P.J.H. King,. 2023. Factors affecting pollination and pollinators in oil palm plantations: a review with an emphasis on the *Elaeidobius kamerunicus* weevil (Coleoptera: Curculionidae). Insects 14: 454. https://doi.org/10.3390/insects14050454.

Gomes, S.M. 2011. Polinizadores e semiquimicos de dendezeiro hibrido (*Elaeis oleifera* (H.B.K.) Cortes X *Elaeis guineensis* JACQ). Ph.D. thesis, Universidade Federal de Vicosa, Viçosa.

Ha, T. S. & D. P. Smith. 2022. Recent insights into insect olfactory receptors and odorant-binding proteins. Insects 13(10); 926. https://doi.org/10.3390/insects13100926.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Hala, N.,Y. Tuo, A.A.M. Akpesse, H.K. Koua & Y. Tano. 2012. Entomofauna of oil palm tree inflorescences at La Mé Experimental Station (Côte d'Ivoire). American Journal of Experimental Agriculture. 2 (3): 306-319.

Hall, T.A. 1999. BioEdit: a user-friendly biological sequence alignment editor and analysis program for Windows 95/98/NT. Nucleic Acids Symposium Series. 41: 95-98.

Hansson, B.S. & M.C. Stensmyr. 2011. Evolution of insect olfaction. Neuron. 72 (5): 698–711. doi: 10.1016/j.neuron.2011.11.003.

Harahap, I.Y. & M.E.S. Lubis. 2018. Dinamika air dan fase-fase perkembangan pembungaan penentu produktivitas kelapa sawit. Jurnal Penelitian Kelapa Sawit. 26(3): 101-112.

Harahap, I.Y., Sumaryanto, T.C. Hidayat, W.R. Fauzi & Y. Pangaribuan. 2017. Produksi jenis kelamin tandan bunga kelapa sawit dan responsnya terhadap perlakuan *exogenous hormone* tanaman pada lahan yang mengalami kekeringan. Jurnal Penelitian Kelapa Sawit. 25(1): 31-46.

Harahap, I.Y., Sumaryanto, W.R. Fauzi, A.E. Prasetyo, R. Damanik & M. Arif. 2013. Buah landak kelapa sawit: ditinjau dari aspek ekofisiologi. Prosiding Pertemuan Teknis Kelapa Sawit 7-9 Mei 2013, Jakarta.

Haran, J., R.F., X.N. Abanda, L. Benoit, C. Bakoume & L. Beaudoin-Ollivier. 2020a. Multilocus phylogeography of the world populations of *Elaeidobius kamerunicus* (Coleoptera, Curculionidae), pollinator of the palm *Elaeis guineensis*. Bull. Entomol. Res. 110(5): 654-662. doi: 10.1017/S0007485320000218.

Haran, J.M., Beaudoin-Ollivier, L. Benoit & G. Kuschel. 2020b. Revision of the palm-pollinating weevil genus *Elaeidobius* Kuschel, 1952 (Curculionidae, Curculioninae, Derelomini) with descriptions of two new species. European Journal of Taxonomy. 684: 1–32. https://doi.org/10.5852/ejt.2020.684.

Harun, M.H. & M.R. Noor. 2002. Fruit set and oil palm bunch components. *Journal of Oil Palm Research.* 14 (2): 24-33.

Hasibuan, R., I.G. Swibawa, A.M. Hariri, S. Pramono, F.X. Susilo & N. Karmike. 2002. Dampak aplikasi insektisida permetrin terhadap serangga hama (*Thosea* sp.) dan serangga penyerbuk (*Elaeidobius kamerunicus*) dalam agroekosistem kelapa sawit. J. Hama dan Penyakit Tumbuhan Tropika. 2 (2): 42-46.

Hayes, E.J. & R. Wall. 2002. Age-grading adult insects: A review of techniques. Physiological Entomology 24(1):1–10. DOI:10.1046/j.1365-3032.1999.00104.x.

Hidayat, T.C., I.Y. Harahap, Y. Pangaribuan, W.R. Fauzi & W.A. Harsanto. 2012. Bunga, buah dan produksi kelapa sawit. Buku Seri Populer Kelapa Sawit. Medan: Pusat Penelitian Kelapa Sawit. 51p.

Hussein, M., N. Lajis, A. Kinson & C. Teo. 1989. Laboratory and field evaluation on the attractancy of *Elaeidobius kamerunicus* Faust to 4-allylanisole. Porim Bulletin. 18: 20– 26.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
Agus Eko Prasetyo, Prof. Ir. Y. Andi Trisyono, M.Sc., Ph.D.; Prof. Ir. Edhi Martono, M.Sc., Ph.D.; Alan Soffan, S.P., M
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Hutauruk, C.H., Sudharto, G. Simangunsong & A. Sipayung. 1985. Menjelang Dua Tahun Serangga Penyerbuk Kelapa Sawit *Elaeidobius kamerunicus* di Indonesia. Simposium Kelapa Sawit, Medan, Indonesia. 27 – 28 Maret 1985: 183 – 225.

Hutauruk, C.H. & S. Syukur. 1985. Serangga Penyerbuk Kelapa Sawit di Cote d,Ivoire, Benin dan Republic du Cameroun Afrika Barat. Buletin Pusat Penelitian Marihat. 5 (1): 29 – 42.

Hutauruk, C.H & Sudharto. 1984. Perkembangan Populasi *Elaeidobius kamerunicus* Faust di berbagai Kebun Kelapa Sawit di Indonesia. Buletin Pusat Penelitian Marihat, 4(1): 8-22.

Hutauruk, C.H., A. Sipayung & Sudharto. 1982. *Elaeidobius kamerunicus* Fst: hasil Uji Kekhususan Inang dan Peranannya Sebagai Penyerbuk Kelapa Sawit. Buletin Pusat Penelitian Marihat. *3*(2): 1-15.

Idris, A.B. M. Ramle, K. Norman, S.M.D. Syarifah-Nadia, H. Noor- Hisham, N.A.L. Fatihah, A.M.L. Hakim, M.H. Fahmi & T.M. Teo. 2016. Oil palm pollinators in Malaysia: implication to oil palm industry and malaysia economy. Proceeding of Sixth IOPRI-MPOB International Seminar of Pests and Diseases, Medan, Indonesia. pp 144-152.

Ismail, N.F., I.A. Ghani & N.W. Othman. 2020. Detrimental effect of commonly used insecticides in oil palm pollinating weevil, *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae). Journal of Oil Palm Research 32(3): 439-452.

Jervis, M.A., J. Ellers & J.A. Harvey. 2008. Resource acquisition, allocation, and utilization in parasitoid reproductive strategies. Annual Review of Entomology. 53: 361–385. https://doi.org/10.1146/annurev.ento.53.103106.093433.

Joly, E. J. & C. Merlin. 2004. Insect olfactory receptors: contributions of molecular biology to chemical ecology. Journal of Chemical Ecology 30(12): 2359-97. doi: 10.1007/s10886-004-7941-3.

Kahono, S., P. Lupiyaningdyah, Erniwati & H. Nugroho. 2012. Potensi dan pemanfaatan serangga penyerbuk untuk meningkatkan produksi kelapa sawit di perkebunan kelapa sawit desa Api-Api, kecamatan Waru, kabupaten penajam Paser Utara, Kalimantan Timur. Zoo Indonesia. 21 (2): 23-34.

Kalidas, P., P. Rajasekhar & S.V.L. Lalitha. 2008. Impact of pesticides on the pollinating weevils of oil palm. Journal of Plantation Crops. 2008. 36 (3): 460-462.

Kang, S.M. & Z.A. Karim. 1982. Quarantine aspects of the introduction into Malaysia of an oil palm insect pollinator. In Proceedings of International Plant Protection in the Tropics. Malaysian Plant Protection Society. Kuala Lumpur.

Katlav, A., J.M. Cook & M. Riegler. 2023. Effect of oviposition delay on early reproductive effort and offspring fitness in a thrips species. Animal Behaviour. 200: 199-207. https://doi.org/10.1016/j.anbehav.2023.03.014.

Koeduka, T., E. Fridman, D.R. Gang, D.G. Vassão, B.L. Jackson, C.M. Kish, I. Orlova, S.M. Spassova, N.G. Lewis & J.P. Noel. 2006. Eugenol and isoeugenol,

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

characteristic aromatic constituents of spices, are biosynthesized via reduction of a coniferyl alcohol ester. Proc. Natl. Acad. Sci. U S A. 103 (26):10128–33.

Kok, C.C., O.K. Eng, A.R. Razak, P.G. Marcon & L.K. Loong. 2010. Chlorantraniliprole: a novel insecticide for bagworm (*Metisa plana*) control in oil palm plantation. The Planters. 86 (1009): 223 – 235.

Kouakou, M., K.A. Hala, N, Hala & M. Dagnogo. 2018. Efficacité de la pollinisation entomophile du palmier a huile dans les plantations du sud-ouest et Du Sud-Est De La Côte d'Ivoire. European Scientific Journal. 14 (12): 392-406. Doi:10.19044/esj.2018.v14n12p392.

Krantz, G.W. & G.O. Poinar. 2004. Mites, nematodes and the multimillion dollar weevil. Journal of Natural History. 38 (2): 135-141. DOI: 10.1080/00222930210000041734.

Kurniawan, Y. 2010. Demografi dan populasi kumbang *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) sebagai penyerbuk kelapa sawit (*Elaeis guineensis* Jacq.). Thesis. Bogor: Sekolah Pascasarjana, Insitut Pertanian Bogor.

Kusnandarsyah, I. 2011. Populasi nematoda parasit pada kumbang *Elaeidobius kamerunicus* Faust. Skripsi. Bogor: Depertemen Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Institut Pertanian Bogor. 17p.

Labarca, M.V. & Z. Narvaez. 2009. Identification and pollinating insect's population fluctuation in oil palm (*Elaeis guineensis* Jacquin) in south of Maracaibo Lake, Zulia state, Venezuela. Rev. Fac. Agron. Univ. Zulia. 26: 305–324.

Lawson, D.A. & S.A. Rands. 2018. The effects of rainfall on plant–pollinator interactions. Arthropod-Plant Interactions 13: 561–569. https://doi.org/10.1007/s11829-019-09686-z.

Li, K., I. Grass, T. Y. Fung, R. Fardiansah, M. Rohlfs, D. Buchori, & T. Tscharntke. 2022. Adjacent forest moderates insect pollination of oil palm. Agriculture, Ecosystems & Environment 338: 108108. https://doi.org/10.1016/j.agee.2022.108108.

Li, K., T. Tscharntke, B. Saintes, D. Buchori & I. Grassa. 2019. Critical factors limiting pollination success in oil palm: A systematic review. Agriculture, Ecosystems and Environment. 280: 152–160. https://doi.org/10.1016/j.agee.2019.05.001.

Li, R., V.A. Reddy, J. Jin, C. Rajan, C.H. Lim, N.H. Chua, J. Ye & R. Sarojam. 2017. Comparative transcriptome analysis of oil palm flowers reveals an EAR-motif- containing R2R3-MYB that modulates phenylpropene biosynthesis. BMC Plant Biology. 17: 219. DOI 10.1186/s12870-017-1174-4.

Liau, S.S., K.H. Goh & K.W. Chan. 1983. Some Effects of the weevil, *Elaeidobius kamerunicus* Faust (Curculionidae) on the Malaysian Oil Palm Industry – (i) Ecological. Proceedings of Kumpulan Guthrie Sdn. Bhd. Seminar, Port Dickson: 48-64.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Lu, J., L. Shen, A.H. Hamadou, S. Jiang & B. Xu. 2024. Effect of temperature and relative humidity on the development of *Sitophilus oryzae* L. (Coleoptera: Curculionidae) reared on noodles. Journal of Stored Products Research 105: 102213. https://doi.org/10.1016/j.jspr.2023.102213.

Lubis, F.I., Sudrajat & D. Dono. 2017. Populasi serangga penyerbuk kelapa sawit *Elaeidobius kamerunicus* Faust dan pengaruhnya terhadap nilai fruit set pada tanah berliat, berpasir dan gambut di Kalimantan Tengah, Indonesia. Jurnal Agrikultura. 28 (1): 39-46.

Lubis, F.I., I. Agustin, Riana, L. Kurniawan & S. Latif. 2014. The occurrence of poor fruit set at Central Kalimantan. Proceeding of International Oil Palm Conference, Bali, Indonesia.

Lubis, F.I., S. Sudarjat, I.N. Bari & U. Supratman. 2023a. Identification of volatile compounds of oil palm flower (*Elaeis guineensis* Jacq.) with gas chromatography and mass spectrometry based on the difference in time. Indones. J. Chem. 23 (4): 948 – 960. DOI: https://doi.org/10.22146/ijc.78682.

Lubis, F.I., I. Agustin, I. Mailisa, G.I.S. Putra, Taufiq, C.P. Damayani & D.T. Lestari. 2023b. Attractiveness preferences of *Elaeidobius kamerunicus* Faust. to different composition volatile organic compounds of female inflorescence on clay, sandy, and peat soil type. IOP Conf. Series: Earth and Environmental Science 1133: 012038. doi:10.1088/1755-1315/1133/1/012038.

Lubis. A.U. 2008. *Kelapa Sawit (Elaeis guineensis Jacq) Di Indonesia.* Medan: Pusat Penelitian Kelapa Sawit.

Lubis, A.U. 1993. Pedoman pengadaan benih kelapa sawit. Medan: Pusat Penelitan Kelapa Sawit.

Lubis, A.U. dan A. Sipayung. 1987. Serangga Penyerbuk Kelapa Sawit, *E. kamerunicus* Di Indonesia 1983 – 1987. Makalah Pertemuan Balai Penelitian dan Direksi PTP. April 1987 di Tanjung Morawa.

Lubis, A.U. & A. Sipayung. 1986. Evaluasi kehadiran SPKS *Elaeidobius kamerunicus* sampai dengan tahun ketiga di Indonesia. Prosiding Temu Ilmiah Entomologi Perkebunan Indonesia. p. 69-85.

Lumentut, N. & M.L.A. Hosang. 2016. Demografi kumbang *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) sebagai serangga polinator pada tanaman kelapa sawit. Buletin Palma. 17 (1): 89-95.

Luqman, M.H.A., M.N. Dzulhelmi, A.B. Idris & R.H. Izfa. 2017. The potential natural predators of *Elaeidobius kamerunicus* Faust, 1878 (Coleoptera: Curculionidae) in Malaysia. Serangga. 22 (2): 239-252.

Makhdzir, M. 2016. Issues related to low fruit set in oil palm. Proceeding of Sixth IOPRI-MPOB International Seminar of Pests and Diseases, Medan, Indonesia. pp 144-152.

Maria, R.M. & P.P. William. 2016. Pollination in the oil palms *Elaeis guineensis, E. oleifera* and their hybrids (OXG), in tropical America. Pesq.Agropec. Trop., Goiania. 46 (1): 102-110. www.agro.ufg.br/pat.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Mariau, D. & P. Genty. 1988. IRHO contribution to the study of oil palm insect pollinators in Africa, South America and Indonesia. Oleagineux. 43 (6): 233-240.

Maryeni, R & D. Rezki. 2018. Pemberdayaan masyarakat melalui aplikasi teknik *hatch & carry Elaeidobius kamerunicus* untuk meningkatkan fruit set kebun kelapa sawit rakyat. Jurnal Pengabdian kepada Masyarakat MADANI. 4 (2): 83-87.

Mayfield, T. & M. Margaret. 2005. The importance of nearby forest to known and potential pollinators of oil palm (*Elaeis guineensis* Jacq.) (Arecaceae) in Southern Costa Rica. Economic Botany. 59 (2): 190-196

Meléndez, M.R., M.A. Racines-Oliva, A.A. Galvis, A.S. Dávila & W.P. Ponce. 2019. Oil Palm Pollinator Dynamics and Their Behavior on Flowers of Different Oil Palm Species *Elaeis guineensis*, *Elaeis oleifera* and the *oleifera* x *guineensis* Hybrid in Ecuador. Pertanika J. Trop. Agric. Sc. 42 (4): 1295 – 1320.

Mendelez, M.R. & W.P. Ponce. 2016. Pollination in the oil palms *Elaeis guineensis*, *E. oleifera* and their hybrids (OxG), in tropical America. Pesq. Agropec. Trop., Goiânia. 46 (1): 102-110.

Misztal, P.K., S.M. Owen, A.B. Guenther, R. Rasmusen, C. Geron, P. Harley, G.J. Phillips, A. Ryan, D.P. Edwards, C.N. Hewitt, E. Nemitz, J. Siong, M.R. Heal & J.N. Cape. 2010. Large estragole fluxes from oil palm in Borneo. Atm. Chem. Phy. Disc. 10:1517-1557.

Mohd-Rizuan, Z.A., H. Noor-Hisham & A. Samsudin. 2013. Role of pollinating weevil (*Elaeidobius kamerunicus*), seasonal effect and its relation to fruit set in oil palm area of FELDA. Proceeding of PIPOC 2013 Conference, KLCC, Kuala Lumpur, Malaysia, November 19-21, 2013.

Murai, T. 2001. Development and reproductive capacity of *Thrips hawaiinensis* (Thysanoptera: Thripidae) and its potential as major pests. Bulletin of Entomological Research. 91: 193-198.

Myint, K.A., M.Y. Rafii, S.A. Sheikh-Abdullah, N.M. Lwin, A. Mohd-Din & M.A. Latif. 2012. Determination of the optimum pollen germination medium for different fruit forms of oil palm (*Elaeis guineensis*). Journal of Animal & Plant Sciences. 14 (Issue 1): 1855-1865.

Najihah, S.M.Z., R. Rusli, M.H. Hussain & J. Jalinas. 2019. Survival rate and development of larvae *Elaeidobius kamerunicus* (Coleoptera: Curculionidae) on artificial diets. Serangga. 24 (1): 126-141.

Ningrum, D.A., S. Wening & S. Hanum. 2014. Screening of AFLP Primers for Molecular Variability Test in Wild Type Oil Palm (*Elaeis guineensis* Jacq.) from Cameroon. 2014 International Oil Palm Conference, Nusa Dua, Bali. IOPRI.

Norman, K., M. Ramle, S.A. Rosman, A. Costa & R. Sivapragasam. 2018. Fruit set and weevil pollination issues in oil palm. Planter. 94: 565–578.

Oil World. 2025. Palm oil: world production, yield, and mature area. http://www.oilworld.biz. ISTA Mielke GmBh Hamburg. Diakses 19 September 2025.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
Agus Eko Prasetyo, Prof. Ir. Y. Andi Trisyono, M.Sc., Ph.D.; Prof. Ir. Edhi Martono, M.Sc., Ph.D.; Alan Soffan, S.P., M
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Omar, D. 2011. Toxicity of TMOF against the oil palm pollinator, *Elaeidobius kamerunicus* Faust. *Final Report*. Department of Plant Protection, Faculty of Agriculture, University Putra Malaysia.

Ozaki, K., M. Ryuda, A. Yamada, A. Utoguchi, H. Ishimoto, D. Calas, F. Marion-Poll, T. Tanimura & H. Yoshikawa. 2011. A gustatory receptor involved in host plant recognition for oviposition of a swallowtail butterfly. Nat Commun. 2: 542.

Palm Oil Agribusiness Strategic Policy Institute [PASPI]. 2018. Mitos dan fakta industry kelapa sawit Indonesia dalam isu sosial, ekonomi dan lingkungan global (edisi 3). Bogor: PASPI. 270p.

Pardede, D., C.U. Ginting & H. Wibowo. 1996. Dampak berbagai insektisida pengendali ulat api terhadap kumbang penyerbuk *Elaeidobius kamerunicus* pada perkebunan kelapa sawir. Warta PPKS. 4 (3): 143-148.

Permana, A.D., R.E. Putra, A. Susanto & A.S. Leksono. 2021. *Elaeidobius kamerunicus* (Coleoptera: Curculionidea): activity on oil palm flower in Central Kalimantan, Indonesia. Pakistan Journal of Biological Sciences 24(11): 1209–1216.

Permana, A.D., B. Permana, B. Sahari, R.E. Putra & I. Kinasih. 2017. Estimating numbers of oil palm (*Elaeis guineensis*) pollen grains using image analysis and processing. Journal of Oil Palm Research. 29 (3): 311-317.

Pernando, R.D., D. Susilastuti, F.D. Rahmayanti & F.I. Lubis. 2022. Pengaruh cuaca, musuh alami, dan persentase kerusakan buah terhadap populasi serangga penyerbuk kelapa sawit di tanah sulfat masam. Jurnal Kultivasi Vol. 21 (1): 69-74. ISSN: 1412-4718, eISSN: 2581-138x.

Poinar, G.O. Jr., T.A. Jackson, N.L. Bell & M.W. Basri. 2002. *Elaeolenchus parthenonema* n.g., n.sp. (Nematoda: Sphaerularioidea: Anandranematidae n. fam.) parasitic in the palm- pollinating weevil *Elaeidobius kamerunicus* Faust, with a phylogenetic synopsis of the Sphaerularioidea Lubbock, 1861. Systematic Parasitology 52: 219-225.

Ponnamma, K.N., A. Sajeebkhan, Vijayan & Asha. 2006. Adverse factors affecting the population of pollinating weevil, *Elaeidobius kamerunicus* F and fruit set on oil palm in India. Planter. 82: 555–557.

Potter, L. 2015. Managing oil palm landscapes: A seven-country survey of the modern palm oil industry in Southeast Asia, Latin America and West Africa. Occasional Paper 122. Cifor Ed., Bogor, Indonesia 145 p.

Pradiko, I., E.N. Ginting, N.H. Darlan, Winarna & H.H. Siregar. 2016. Hubungan pola curah hujan dan performa tanaman kelapa sawit di pulau Sumatra dan Kalimantan selama El Niño 2015. Jurnal Penelitian Kelapa Sawit. 24 (2): 87-96.

Prasetyo, A.E., A. Susanto & H.Y. Rahmadi. 2025. Response of *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) visits and fruit set formation on various oil palm germplasm. IOP Conf. Series: Earth and Environmental Science 1494: 012016. doi:10.1088/1755-1315/1494/1/012016.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Prasetyo, A.E., N. Supena & A. Susanto. 2021. Kajian penunasan berat pelepah terhadap kuantitas dan kualitas bunga jantan kelapa sawit serta ketertarikan *Elaeidobius kamerunicus* Faust. Buletin Palma 22(1): 52-61.

Prasetyo, A.E. & A. Susanto. 2019. Pengaruh insektisida terhadap aktivitas dan kemunculan kumbang baru *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) pada bunga jantan kelapa sawit (*Elaeis guineensis* Jacq.). J. Pen. Kelapa Sawit. 27 (1): 13-24.

Prasetyo, A.E., T.A.P. Rozziansha, H. Priwiratama, S. Wening, A. Susanto & R.D. de Chenon. 2019a. Perspectiva bioecológica de *Elaeidobius kamerunicus* en relación con el llenado de frutos de palma de aceite en Indonesia. PALMAS. 40 (Especial Tomo I): 94-110.

Prasetyo, A.E., H. Priwiratama, T.A.P. Rozziansha, & A. Susanto. 2019b. Pentingnya introduksi *Elaeidobius kamerunicus* pada pengembangan kebun kelapa sawit di pulau baru di indonesia. Warta PPKS. 24 (1): 37-43.

Prasetyo, A.E., J.A. Lopez, J.R. Eldridge, D.H. Zommick & A. Susanto. 2018. Long-term study of *Bacillus thuringiensis* application to control *Tirathaba rufivena,* along with the impact to *Elaeidobius kamerunicus,* insecr biodiversity and oil palm productivity. Journal of Oil Palm Research. 30 (1):1 – 82. DOI: https: //doi.org/10.21894/jopr.2017.0002.

Prasetyo, A.E. & A. Susanto. 2016. Perkembangan populasi *Elaeidobius kamerunicus* Faust pasca introduksi dan peningkatan fruit set kelapa sawit di Pulau Seram, Maluku, Indonesia. J. Pen. Kelapa Sawit. 24 (1): 47-55.

Prasetyo, A.E., D. Sunindyo & A. Susanto. 2015. Flubendiamida: insektisida potensial untuk hama kelapa sawit yang aman terhadap *Elaeidobius kamerunicus* Faust. Prosiding PTKS 19-21 Mei 2015, Yogyakarta.

Prasetyo, A.E., W.O. Purba & A. Susanto. 2014. *Elaeidobius kamerunicus*: application of hatch and carry technique for increasing oil palm fruit set. *Journal of Oil Palm Research* 26 (3): 195-202.

Prasetyo, A.E. & A. Susanto. 2014. Status of *Elaeidobius kamerunicus* towards 30 years in Indonesia. *Proceedings of IOPC 2014*, Bali, Indonesia, Session VI: 340-348.

Prasetyo, A.E. 2013. Aktivitas *Elaeidobius kamerunicus* Faust pada perkebunan kelapa sawit yang berpotensi produksi tinggi. Warta PPKS. 18 (2): 59-65.

Prasetyo, A.E., M. Arif & T.C. Hidayat. 2012. Buah landak pada tanaman muda kelapa sawit. *Warta PPKS,* 17(1), 13-20.

Prasetyo, A.E. & A. Susanto. 2012a. Meningkatkan *Fruit Set* kelapa sawit dengan teknik hatch & carry *Elaeidobius kamerunicus.* Seri Kelapa Sawit Populer 11 Pusat Penelitian Kelapa Sawit, Medan, Indonesia. 61p.

Prasetyo, A.E. & A. Susanto. 2012b. Serangga penyerbuk kelapa sawit *Elaeidobius kamerunicus* Faust: agresivitas dan dinamika populasi di Kalimantan Tengah. Jurnal Penelitian Kelapa Sawit. 20 (3): 103-113.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
Agus Eko Prasetyo, Prof. Ir. Y. Andi Trisyono, M.Sc., Ph.D.; Prof. Ir. Edhi Martono, M.Sc., Ph.D.; Alan Soffan, S.P., M
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Price, P.W. 1997. Insect Ecology. John Wiley and Sons, New York, Toronto, Singapore. 607p.

Priwiratama, H., A.E. Prasetyo & A. Susanto. 2015. Peningkatan *Fruit Set* Kelapa Sawit di Kalimantan dengan Introduksi *Elaeidobius kamerunicus* Faust dari Sumatra Utara. Prosiding PTKS 19-21 Mei 2015, Yogyakarta.

Purba, A.R., A.E. Prasetyo, A. Kurniawan, N. Supena, H.A. Siregar, Sujadi, H.A. Hasibuan, M. Arif & E. Suprianto. 2016. Oil Palm Pollinator Weevil *Elaeidobius kamerunicus* and the Fruit Set in Indonesia. Proceeding of Sixth IOPRI-MPOB International Seminar of Pests and Diseases, Medan, Indonesia. pp 153-161.

Purba, A.R., E. Supriyanto, N. Supena & M. Arif. 2009. Peningkatan produktivitas kelapa sawit dengan menggunakan bahan tanaman unggul. Prosiding Pertemuan Teknis Kelapa Sawit, Jakarta.

Purba, R.Y, A.F. Lubis & A. Susanto. 2011. Kajian populasi serangga penyerbuk kelapa sawit *Elaeidobius kamerunicus* Faust dan *Thrips hawaiinensis* Morgan di Kawasan Barat Indonesia. *Prosiding Pertemuan Teknis Kelapa Sawit.* Pusat Penelitian Kelapa Sawit.

Purba, R.Y., I.Y. Harahap, Y. Pangaribuan & A. Susanto. 2010. Menjelang 30 tahun keberadaan serangga penyerbuk kelapa sawit *Elaeidobius kamerunicus* Faust di Indonesia. Jurnal Penelitian Kelapa Sawit. 18(2): 73-85.

Purba, R.Y. 2005. Foto tanaman kelapa sawit yang ditanam pertama pada 1848 masih tegak berdiri pada 1992 dan tumbang pada tahun 2000-an. Komunikasi pribadi pada 5 Agustus 2005.

Pusat Penelitian Kelapa Sawit [PPKS]. 2020. Product knowledge 2020: profil, produk riset, dan pelayanan jasa. Medan: Pusat Penelitian Kelapa Sawit. 100p.

Rahardjo, B.T., A. Rizali, I.K. Utami, S. Karindah, R.D. Puspitarini & B. Sahari. 2018. Populasi *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) pada beberapa umur tanaman kelapa sawit. Jurnal Entomologi Indonesia. 15 (1): 31-39. DOI: 10.5994/jei.15.1.31.

Rahayu, S. 2009. Peranan senyawa volatile kelapa sawit (*Elaeis guineensis* Jacq) bagi serangga penyerbuk *Elaeidobius kamerunicus* Faust dan *Thrips hawaiinensis* Morgan [disertasi]. Bandung: Institut Teknologi Bandung.

Riley, S.O., S.K, Dery., K. Afreh-Nuamah., D, Agyei-Dwarko., & R.G, Ayizannon. 2022. Pollinators of oil palm and relationship to fruitset and yield in two fruit forms in Ghana. OCL, 29, 17. https://doi.org/10.1051/ocl/202210047.

Ritung, S., K. Nugroho, A. Mulyani & E. Suryani. 2011. Petunjuk Teknis (Juknis) Evaluasi Lahan untuk Komoditas Pertanian. Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian Badan Penelitian dan Pengembangan Pertanian, Kementerian Pertanian, Bogor. 171 hal.

Rizali, A., B.T. Rahardjo, S. Karindah, F.R. Wahyuningtyas, Nurindah, B. Sahari & Y. Clough. 2019. Communities of oil palm flower-visiting insects: investigating the covariation of *Elaeidobius kamerunicus* and other dominant species. PeerJ. 7: e7464. http://doi.org/10.7717/peerj.7464.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
Agus Eko Prasetyo, Prof. Ir. Y. Andi Trisyono, M.Sc., Ph.D.; Prof. Ir. Edhi Martono, M.Sc., Ph.D.; Alan Soffan, S.P., M
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Romero, H.M. 2019. La polinización artificial con reguladores de crecimiento incrementa la producción de aceite en híbridos interespecíficos OxG. Palmas. 40 (Especial Tomo I): 140-141.

Romero, H.M., E. Daza, N. Urrego, I. Ayala, Y. Rivera-Mendez & R. Ruiz-Romero. 2019. How to reach 10 tons of oil per hectare per year: induction of high oleic oil production from parthenocarpic fruits in oil palm OxG interspecific hybrids (*Elaeis oleifera* Cortes x *Elaeis guineensis* Jacq.). Proceedings of the PIPOC 2019 International Palm Oil Congress (Agriculture, Biotechnonoly & Sustainability), Kuala Lumpur, Malaysia. pp 54-59.

Roubik, D.W. 1995. Pollination of cultivated plants in the tropics. Food and Agriculture Organization of the United Nations. Rome. 209p.

Rozziansha, T.A.P., A.A. Fitriani, R.J. Girsang & A.E. Prasetyo. 2017. Biology of *Elaeidobius kamerunicus* in the Lowland and Highland on North Sumatra, Indonesia. Proceeding of International Society of Oil Palm Agronomist, Malaysia 15 November 2017.

Saharul A.M., M.M. Mazmira, N. Kamarudin, M.R. Sulaiman, A. Costa, M.O. Abdullah, H. Othman, S.N. Ahmad, M.N.Y. Syarif, Z.A. Abdul, A.G. Idris, S. Amit, A. Zakaria, S.C. Ming, S.T. Chuan, J. Jalinas, Y.Y. Koong, A.A. Sairi, S.M.F. Syed Ali, M. Abdullah, S. Annamalai, K.J. Hung, M. Azmi, A.S. Idris, R. Moslim, & A.G.K.A. Parveez. 2023a. Impact of *Elaeidobius kamerunicus* (faust) introduction on oil palm fruit formation in malaysia and factors affecting its pollination efficiency: a review. Journal of Oil Palm Research 35(1): 1-22. DOI: https://doi.org/10.21894/jopr.2022.0021.

Saharul A.M., J.H. King, S.N. Ahmad, M.A. Mohammed, M.R. Sulaiman & and M.M. Mohd Masri. 2023b. The insect pest management strategies and their influence on the emergence rate of *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) from the post-anthesising male inflorescence of oil palm, *Elaeis guineensis*. Malaysian Applied Biology (2023) 52(5): 147-154. https://doi.org/10.55230/mabjournal.v52i5.icfic06.

Sambathkumar, S. & A.M. Ranjith. 2011. Insect pollinators of oil palm in Kerala with special reference to African weevil, *Elaeidobius kamerunicus* Faust. Pest Management in Horticultural Ecosystems. 17 (1): 14-18.

Saravanan, L., P. Kalidas, K.R. Babu & T. Phanikumar. 2014. Factors affecting the activity of pollinating weevil, *Elaeidobius kamerunicus* Faust. in irrigated oil palm plantations. Agrotechnol. 2 (4): 149. http://dx.doi.org/10.4172/2168-9881.S1.007.

Saravanan, L., V. Suchitra & T. Phanikumar. 2023. Pollination activity of *Elaeidobius kamerunicus* Faust in oil palm and cocoa (*Theobroma cacao* L.) intercropping system in India. Journal of Oil Palm Research. Article in Press. DOI: https://doi.org/10.21894/jopr.2023.0035

Savi, S. 2018. The palm oil market: growth and trends. Chapiter 1. pp. 3-15 Achieving sustainable cultivation of oil palm Volume 1. Introduction, breeding and cultivation techniques. A. Rival Ed., Burleighh Dodds Science Publishing, Philadelphia, USA. 286 p.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
Agus Eko Prasetyo, Prof. Ir. Y. Andi Trisyono, M.Sc., Ph.D.; Prof. Ir. Edhi Martono, M.Sc., Ph.D.; Alan Soffan, S.P., M
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Schoonhoven, L.M., J.J.A. van Loon & M. Dicke. 2005. Insect-plant biology. Oxford University Press, Oxford.

Setyawan, Y.P., M. Naim, A.D. Advento & J.P. Caliman. 2020. The effect of pesticide residue on mortality and fecundity of *Elaeidobius kamerunicus* (Coleoptera: Curculionidae). Southeast Asia Plant Protection Conference 2019. IOP Conf. Series: Earth and Environmental Science. 468: 012020 doi:10.1088/1755-1315/468/1/012020.

Sheil, D., A. Casson, E. Meijaard, M. van Noordwijk, J. Gaskell, J. Sunderland-Groves, K. Wertz & M. Kanninen. 2009. The impacts and opportunities of oil palm in southeast Asia: what do we know and what do we need to know? occasional paper 51. CIFor, Bogor, Indonesia. https://doi.org/10.17528/cifor/002792.

Simanjuntak, D., A.E. Prasetyo & A. Susanto. 2015. Karakteristik populasi, siklus hidup, dan aktivitas *Elaeidobius kamerunicus* di perkebunan kelapa sawit dtaran tinggi. Warta PPKS. 20 (1): 19-24.

Sipayung, A. & A.U. Lubis. 1987. Dampak Pelepasan *Elaeidobius kamerunicus* Fst di Indonesia Dan Malaysia. Buletin Pusat Penelitian Marihat. *7*(2): 7-14.

Sipayung, A., D. Duryadi & A.U. Lubis. 1987. *Preferensi Tikus Terhadap Jenis Makanan Dalam Ekosistem Perkebunan Kelapa Sawit.* Laporan akhir kerjasama penelitian Pusat Penelitian Marihat – Biotrop SIMEO Bogor, Indonesia.

SK Mentan, 2019 No. 833/KPTS/SR.020/M/12/2019 tentang Penetapan Luas Tutupan Kelapa Sawit Indonesia Tahun 2019.

Socha, J., D. Cayón, G. Ligarreto & G. Chaves. 2019. Effect of pollen doses on fruit formation and oil production in two hybrid palm genotypes (*Elaeis oleifera* H.B.K. Cortes x *Elaeis guineensis* Jacq.). Agronomía Colombiana. 37(1): 12-17. Doi: 10.15446/agron.colomb.v37n1.75313.

Su, C.M. 2020. Biology and management of oil palm bunch moth, *Tirathaba mundella* (Insecta: Lepidoptera) in oil palm plantation on peat soil in Serawak, Malaysia. PhD Thesis. Universiti Putra Malaysia. 282p.

Susanto, A., H. Priwiratama & A.E. Prasetyo. 2020. Hubungan kesehatan tanaman terhadap penyerbukan kelapa sawit. Warta PPKS. 25 (2): 92-100.

Susanto, A., A.E. Prasetyo, H. Priwiratama, T.A.P. Rozziansha, D. Simanjuntak, Sudharto, R.D. de Chenon, A. Sipayung, R.Y. Purba. 2015. Kunci Sukses Pengendalian Hama dan Penyakit Kelapa Sawit. Pusat Penelitian Kelapa Sawit, Medan.

Susanto, A. & A.E. Prasetyo. 2014. Pengaturan kastrasi yang benar: sistem buang bunga betina dan pertahankan bunga jantan pada tanaman muda kelapa sawit. Warta PPKS 19 (2): 71-75.

Susanto, A., A.E. Prasetyo, H.Y. Rahmadi, H. Santoso, H.A. Hasibuan & A.R. Purba. 2014. Rendemen-meter kelapa sawit. Warta PPKS. 19 (3): 91-101.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Susanto, A., R.Y., Purba & A.E. Prasetyo. 2007. *Elaeidobius kamerunicus:* Serangga Penterbuk Kelapa Sawit. Seri Buku Saku 28 Pusat Penelitian Kelapa Sawit, Medan.

Swaray, S., Y.M. Rafii, M. Din Amiruddin, M.F. Ismail, S. Jamian, M. Jalloh, Y. Oladosu, M.M. Mohamad, M. Marjuni, O.K. Kolapo & S.C. Chukwu. 2021. Assessment of Oil Palm Pollinating Weevil (*Elaeidobius kamerunicus*) Population Density in Biparental dura × pisifera Hybrids on Deep Peat-Soil in Perak State, Malaysia. Insects 12: 221. https://doi.org/10.3390/insects12030221.

Syarifah, N.S.M.D & A.G. Idris. 2016. Population density of oil palm pollinator weevil *Elaeidobius kamerunicus* based on seasonal effect and age of oil palm. AIP Conference Proceedings. 1784: 060051. doi: 10.1063/1.4966889.

Syed, R.A. dan A. Saleh. 1987. Population of *Elaeidobius kamerunicus* Fst in Relation to fruit Set. *International Oil Palm Conference.* Kuala Lumpur, Malaysia.

Syed, R.A. 1982. Study on Oil Palm Pollination by Insect. *Bulletin of Entomological Research,* 69, 213 224.

Syed, R.A. 1979. Studies on oil palm pollination by insects. Bull. Ent. Res. 69: 213-224.

Tambunan, V.B., A. Apriyanto, W. Ajambang, C.E. Etta, B. Sahari, D. Buchori & P. Hidayat. 2020a. Molecular identification and population genetic study of *Elaeidobius kamerunicus* Faust. (Coleoptera: Curculionidae) from Indonesia, Malaysia and Cameroon based on mitochondrial gene. Biodiversitas. 21 (7): 3263-3270. DOI: 10.13057/biodiv/d210749.

Tambunan, V.B., B. Sahari, D. Buchori & P. Hidayat. 2020b. Pollen load and distribution on the body of *Elaeidobius kamerunicus* Faust. (Coleoptera: Curculionidae) within oil palm plantations. Jurnal Entomologi Indonesia. 17 (2): 81-88. DOI: 10.5994/jei.17.2.81.

Tamura, K., G. Stecher, D. Peterson, A. Filipski S. Kumar. 2013. MEGA6: Molecular Evolutionary Genetics Analysis version 6.0. Molecular Biology and Evolution. 30: 2725-2729.

Tan, K.H. & R. Nishida. 2012. Methyl eugenol: its occurrence, distribution, and role in nature, especially in relation to insect behavior and pollination. J. Insect Sci. 12 (1): 56.

Tandon, R., T.N. Manohara, B.H.M. Nijalingappa & K.R. Shivanna. 2001. Pollination and pollen-pistil interaction in oil palm, *Elaeis guineensis*. Ann. Bot. 87: 831–838. doi: 10.1006/anbo.2001.1421.

Teo, T.M. 2015. Effectiveness of the oil palm pollinating weevil, *Elaeidobius kamerunicus*, in Malaysia. UTAR Agriculture Science Journal. 1 (4): 40-43.

Tuo, Y., H.K. Koua & N. Hala. 2011. Biology of *Elaeidobius kamerunicus* and *Elaeidobius plagiatus* (Coleoptera: Curculionidae) main pollinators of oil palm in West Africa. European Journal of Scientific Research. 49 (3): 426-432.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
Agus Eko Prasetyo, Prof. Ir. Y. Andi Trisyono, M.Sc., Ph.D.; Prof. Ir. Edhi Martono, M.Sc., Ph.D.; Alan Soffan, S.P., M
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

United States Department of Agriculture [USDA]. 2021. Oilseeds: world markets and trade. https://apps.fas.usda.gov/psdonline/app/index.html#/app/downloads. Diakses 2 Januari 2021.

United States Department of Agriculture [USDA]. 2019. Classification for kingdom plantae down to genus *Elaeis* Jacq. https://plants.usda.gov/java/ClassificationServlet?source=display&classid=ELAEI. Diakses 31 Desember 2020.

van Dijk, K. & H. Savenije. 2011. Kelapa sawit atau hutan? Lebih dari sekedar definisi. Jakarta: Tropenbos International Indonesia Programme. 20p.

Vos, P., R. Hogers, M. Bleeker, M. Reijans, T. van der Lee, M. Hornes, A. Frijters, J. Pot, J. Peleman, M. Kuiper & M. Zabeau. 1995. AFLP: a new technique for DNA fingerprinting. Nucleic Acids Research. 23: 4407-4414.

Walker, W.B., A. Roy, P. Anderson, F. Schlyter, B.S. Hasson & M. Larsson. 2019. Transcriptome analysis of gene families involved in chemosensory function in *Spodoptera littoralis* (Lepidoptera: Noctuidae). BMC Genomic. 20: 428. https://doi.org/10.1186/s12864-019-5815-x.

Wahyuni, M. 2018. The effectiveness of *Elaeidobius kamerunicus* to the fruit set of oil palm. Elixir Agriculture. 116: 50119-50122.

Wahyunto, Hikmatullah, E. Suryani, C. Tafakresnanto, S. Ritung, A. Mulyani, Sukarman, K. Nugroho, Y. Sulaeman, Y. Apriyana, Suciantini, A. Pramudia, Suparto, R.E. Subandiono, T. Sutriadi, D. Nursyamsi. 2016. Petunjuk Teknis Pedoman Penilaian Kesesuaian Lahan untuk Komoditas Pertanian Strategis Tingkat Semi Detail Skala 1:50.000. Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian, Badan Penelitian dan Pengembangan Pertanian, Bogor. 37 hal.

Waterhouse, D.F. & K.R. Noris. 1987. Biological control: Pasific prospects. Melbourne, Australia: Inkata Press. Pp. 90-94.

Weissling, T.J. & R.M.G. Davis. 1993. Water loss dynamics and humidity preference of *Rhynchophorus cruentus* (Coleoptera: Curculionidae) adults. Enviromental Entomology 22(1): 93-98.

Wening, S., A.E. Prasetyo, T.A.P. Rozziansha & A. Susanto. 2016. Optimasi protocol ekstraksi DNA *Elaeidobius kamerunicus.* J. Pen. Kelapa Sawit. 24 (2): 77-86.

Wicher, D. & F. Miazzi. 2021. Functional properties of insect olfactory receptors: ionotropic receptors and odorant receptors. Cell Tissue Res. 383(1): 7–19. doi: 10.1007/s00441-020-03363-x.

Widiastuti, A. & E.R. Palupi. 2008. Viabilitas serbuk sari dan pengaruhnya terhadap keberhasilan pembentukan buah kelapa sawit (*Elaeis guineensis* Jacq.). Biodiversitas. 9 (1): 35-38. DOI: 10.13057/biodiv/d090109.

Winarna, M.A. Yusuf, S. Rahutomo & E. Sutarta. 2017. Dampak muka air tanah dan amelioran terhadap kelembapan tanah, emisi CO_2 dan produksi kelapa sawit pada tanah gambut. Jurnal Penelitian Kelapa Sawit. 25(3): 147-160.

UNIVERSITAS
GADJAH MADA
Mekanisme Ekologis dan Regulasi Ekspresi Gen yang Menentukan Variasi Efektivitas Penyerbukan Kelapa Sawit oleh Elaeidobius kamerunicus dari Dua Agroekosistem Indonesia
Agus Eko Prasetyo, Prof. Ir. Y. Andi Trisyono, M.Sc., Ph.D.; Prof. Ir. Edhi Martono, M.Sc., Ph.D.; Alan Soffan, S.P., M
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Woittiez, L.S., M.T. van Wijk, M. Slingerland, M. van Noordwijk & K.E. Giller. 2017. Yield gaps in oil palm: A quantitative review of contributing factors. Europ. J. Agronomy. 83: 57-77. https://doi.org/10.1016/j.eja.2016.11.002.

Yaakub, N.Z.Z., N.F.M. Shaipulah, N.Z. Mohamed & A.M. Idrus. 2023. Flower development of male and female inflorescence of oil palm, *Elaeis guineensis* Jacq. Universiti Malaysia Terengganu Journal of Undergraduate Research 5(4): 89-97. https://doi.org/10.46754/umtjur.v5i4.440.

Yousefi, M., S.M.R. Amin, A.A. Samsuzana, A. Syaril & A.R. Afifah. 2020. Introduction of current pollination techniques and factors affecting pollination effectiveness by *Elaeidobius kamerunicus* in oil palm plantations on regional and global scale: A review. South African Journal of Botany. 132: 171179. https://doi.org/10.1016/j.sajb.2020.04.017.

Yue, J., Z. Yan, C. Bai, Z. Chen, W. Lin & F. Jiao. 2015. Pollination activity of *Elaeidobius kamerunicus* (Coleoptera: Curculionidea) on oil palm on Hainan island. Florida Entomologist. 98 (2): 499-505.

Zulkefli, M.H.H., S. Jamian, N.A. Adam, S. Abdullah, M.M.M. Masri, R. Moslim & A.M. Saharul. 2024a. Population density of *Elaeidobius kamerunicus* Faust and abiotic factors effect within anthesising inflorescences of Malaysian oil palm. Serangga, 29(2): 79-95. https://doi.org/10.17576/serangga-2024-2902-07.

Zulkefli, M.H.H., S. Jamian, S.I. Ismail, N.A. Adam, J. Jalinas & M.M. Mohd Masri. 2024b. Nutritional composition of anthesising male inflorescence of oil palm *Elaeis guineensis* essential for development of *Elaeidobius kamerunicus* Faust: first report. Journal of Oil Palm Research 36(2): 254-266. DOI: https://doi.org/10.21894/jopr.2023.0027.

Zulkefli, M.H.H., S. Jamian, N.A. Adam, J. Jalinas & M.M. Mohd Masri. 2022. Laboratory rearing of *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) pollinator of oil palm inflorescence in Malaysia. IOP Conf. Series: Earth and Environmental Science 974: 012033. doi:10.1088/1755-1315/974/1/012033.

Zulkefli, M.H.H., S. Jamian, N.A. Adam, J. Jalinas & M.M. Mohd Masri. 2020. Beyond four decades of *Elaeidobius kamerunicus* Faust (Coleoptera: Curculionidae) in the Malaysian oil palm industry: A review. Journal of Tropical Ecology 36(6): 282–292. DOI: https://doi.org/10.1017/S026646742000022X.