

Francis Ackah Armah

Associate Professor · Biomedical Sciences
University of Cape Coast

ORCID [0000-0001-6560-1147](https://orcid.org/0000-0001-6560-1147) · Google Scholar scholar.google.com/citations?user=M6jzuB8AAAAJ&hl=en · Profile scholar.ucc.edu.gh/staff/a8f1f404-d439-434d-864f-e6527a8812dd

RESEARCH

Interests Drug discovery · plant medicine

Areas Plant Science · Pharmacology · Food Science · Molecular Biology · Public Health, Environmental and Occupational Health · Biochemistry

RESEARCH SUMMARY

51

Publications

556

Citations

12

h-index

18

i10-index

1.54

Field-weighted
impact

9%

World top 10%

Counted from the 51 publications listed below, 2013–2026. Field-weighted impact is the mean over the 43 works scored for it; 1.00 is the world average for works of the same field, type and year. 4 of the 43 papers scored for it are among the world's most cited tenth for their field, type and year.

POSITIONS

Senior Lecturer

Department of Biomedical Sciences, University of Cape Coast, Cape Coast, Ghana

2013–present

Assistant Director of Education

Science, Ghana Education Service Sekondi, Sekondi, Ghana

1998–2013

EDUCATION AND QUALIFICATIONS

PhD

Pharmacognsy, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

2012–2016

MPhil

chemistry, University of Cape Coast, Cape Coast, Ghana

2007–2012

B Sc

chemistry, University of Cape Coast, Cape Coast, Ghana

2002–2006

Certificate A

Education, Enchi College of Education, Enchi, Ghana

1995–1998

SSSCE

Science, Ghana Secodary Technical School (GSTS), Takoradi, Ghana

1991–1993

PUBLICATIONS

Journal articles 50

1. Evans Kwabena Abor, Humphrey P. K. Addy, Emmanuel Adu Sarpong, Pius Kwasi Sam, Alberta Serwah Anning, George Ghartey-Kwansah, Francis Ackah Armah (2026). Machine learning-enhanced nano-QSAR and multiscale modeling for predictive nanomedicine: applications in herbal therapeutics and neglected tropical diseases. *Discover Nano*. <https://doi.org/10.1186/s11671-026-04679-3>
2. Andreas A. Kudom, Martin Bosompem, Michael O. Adu, Benedict Afful, Benjamin Anderson, Francis Armah, Paul A. Asare, Joana Ayettey, Ben A. Mensah, Peter Osei-Wusu Adueming (2026). Urban herbicide use threatens a non-target butterfly (*Hypolimnas misippus*) through direct toxicity and host plant stress in

3. Henneh, Isaac, Ameyaw, Elvis, Bineya, Robert, Armah, Francis, Obese, Ernest, Konjah, Daniels, Otumi, Eric, Ekor, Martins (2026). Ziziphus abyssinica hydro-ethanolic root bark extract attenuates acute inflammation possibly through membrane stabilization and inhibition of protein denaturation and neutrophil degranulation. *West African Journal of Pharmacy*. <https://doi.org/10.82351/wajp.vol29no2.463>
4. Eunice E. Ampem Danso, Justice Kumi, Abigail Aning, Sherif Hamidu, Janet Ampofo, Latif Adams, Isaac Asiamah, Francis Ackah Armah, Alexander K. Nyarko, Desmond Omane Acheampong (2025). Anti-cancer potential of hydroethanolic extracts of Kyllinga nemoralis: An in vitro and in-silico studies. *Pharmacological Research - Natural Products*. <https://doi.org/10.1016/j.prenap.2025.100161>
5. John Alake, Wisdom Ahlidja, Isaac Tabiri Henneh, Augustine Kwabil, Kwabena Darko Adu, Samuel Ansong Asiamah, Du-Bois Asante, Francis Ackah Armah (2025). Bioprospecting the antidiabetic potential of aqueous seed extract of Allanblackia floribunda Oliv. (Clusiaceae). *Food Chemistry Advances*. <https://doi.org/10.1016/j.focha.2025.101071>
6. Samuel Asiamah Obiri, Denzel Opoku-Kwabi, Yaw Opoku-Boahen, Francis Ackah Armah, Malcolm Patrick Fynn, Lawrence Sheringham Borquaye, Isaac Asiamah (2025). Crude alkaloids from Phyllanthus fraternus, Webster: Antibacterial, time-kill kinetics and resistance modulation studies. *Pharmacological Research - Natural Products*. <https://doi.org/10.1016/j.prenap.2025.100312>
7. Isaac Henneh, Fabao Zhao, Robert P. Biney, Kofi Boateng, Leticia Agbesi, Francis A. Armah, Martins Ekor, Boshi Huang (2025). β -Amyrin's Antidepressant-Like Activity in Mice and Zebrafish: Mechanistic Pathways and In Silico Molecular Interactions (Abstract ID: 169408). *Journal of Pharmacology and Experimental Therapeutics*. <https://doi.org/10.1016/j.jpet.2024.100850>
8. Isaac Kingsley Amponsah, Denzel Opoku-Kwabi, Francis Ackah Armah, John Nii Addotey, Bernard Kofi Turkson, Emmanuel Quaye Kontoh (2024). A Systematic Review of Medicinal Plants and Their Compounds Validated as Agents for the Management of Sickle Cell Disease. *Natural Product Communications*. <https://doi.org/10.1177/1934578x241265889>
9. Mustapha A. Ahmed, Elvis O. Ameyaw, Francis A. Armah, Patrick M. Fynn, Isaac Asiamah, George Ghartey-Kwansah, Felix K. Zoiku, Ebenezer Ofori-Attah, Christian K. Adokoh (2024). Alkaloidal Extracts from Avicennia africana P. Beauv. (Avicenniaceae) Leaf: An Antiplasmodial, Antioxidant, and Erythrocyte Viable. *Advances in Pharmacological and Pharmaceutical Sciences*. <https://doi.org/10.1155/2024/4541581>
10. Tamekloe Woasiedem, Ishmael Amoako-Attah, Francis Ackah Armah, Isaac Asiamah (2024). Anti-black pod disease activity of leaf extract of Carica papaya Linn. *Journal of Natural Pesticide Research*. <https://doi.org/10.1016/j.napere.2024.100082>
11. Isaac Tabiri Henneh, Wisdom Ahlidja, Ernest Amponsah Asiamah, Denzel Opoku-Kwabi, Henry Mensah Korsah, Fynn Malcom, Stephen Mensah Arhin, Michael Buenor Adinortey, Francis Ackah Armah (2024). Antinociceptive and anti-ulcerogenic effect of hydroethanolic stem bark extract of Ricinodendron heudelotii (Baill.) Pierre ex. Heckel (Euphorbiaceae): Involvement of the opioidergic pathway and attenuation of oxidative stress. *Journal of Traditional and Complementary Medicine*. <https://doi.org/10.1016/j.jtcme.2024.03.007>
12. Isaac T. Henneh, Isaac Y. Attah, Silas A. Osei, Ernest Obese, Robert Peter Biney, Francis A. Armah, Elvis O. Ameyaw, Janet Agyen Donkor, Sarah Mensah, Martins Ekor (2024). In silico, in vitro and in vivo antiplasmodial activity of β -amyirin and its potential synergistic effect when co-administered with artesunate. *Journal of Pharmacology and Experimental Therapeutics*. <https://doi.org/10.1124/jpet.080.915660>
13. Francis Ackah Armah (2024). Journal of Natural Pesticide Research. *Journal of Natural Pesticide Research*. https://www.researchgate.net/profile/Isaac-Asiamah-4/publication/380469871_Anti-Black_Pod_Disease_Activity_of_Leaf_Extract_of_Carica_papaya_Linn/links/664ba5330b0d2845744b22d0/Anti-Black-Pod-Disease-Activity-of-Leaf-Extract-of-Carica-papaya-Linn.pdf
14. Wisdom Ahlidja, Elvis Fiam Amegayibor, Lily Addae, Evans Kwabena Abor, Henry Mensah Korsah, Denzel Opoku-Kwabi, Francis Ackah Armah, Isaac Tabiri Henneh (2024). Pharmacological and phytochemical properties of a promising African medicinal plant, Sterculia setigera Delile: A systematic review. *Scientific*

15. Anita Nana Abla Oscar Akotey, Isaac Kingsley Amponsah, Francis Ackah Armah, Bernard Kofi Turkson, John Nii Addotey, Yaa Asantewaa Osei, Joseph Adu, Rita Akosua Dickson (2024). Quality characteristics and HPLC detection of phosphodiesterase inhibitors in some herbal capsules indicated for male sexual disorders in Ghana. *Future Journal of Pharmaceutical Sciences*. <https://doi.org/10.1186/s43094-024-00693-3>
16. Mustapha A. Ahmed, George Ghartey-Kwansah, Francis Ackah-Armah, Patrick M. Fynn, Felix K. Zoiku, Ebenezer Ofori-Atta, Christian K. Adokoh (2024). Stage -specific antimalarial activity of alkaloidal fractions of the *Avicennia africana* P. Beauv. (Avicenniaceae) leaf extract. *Microbes and Infectious Diseases /Microbes and Infectious Diseases*. <https://doi.org/10.21608/mid.2024.302814.2138>
17. Isaac Henneh, Robert Biney, Silas Acheampong, Ernest Obese, Francis Armah, Elvis Ameyaw, Martins Ekor (2023). ANTI-EPILEPTOGENIC ACTIVITY OF ZIZIPHUS ABYSSINICA ROOT BARK EXTRACT AND ITS ISOLATED BIOACTIVE COMPOUND, B-AMYRIN. *IBRO Neuroscience Reports*. <https://doi.org/10.1016/j.ibneur.2023.08.1145>
18. Isaac Asiamah, Samuel Asiamah Obiri, Woasiedem Tamekloe, Francis Ackah Armah, Lawrence Sheringham Borquaye (2023). Applications of molecular docking in natural products-based drug discovery. *Scientific African*. <https://doi.org/10.1016/j.sciaf.2023.e01593>
19. Evelyn Asante-Kwatia, Lord Gyimah, Arnold Donkor Forkuo, William Kofi Anyan, Makafui Adzo Gbemu, Francis Ackah Armah, Abraham Yeboah Mensah (2023). Ethnobotanical Survey and Cercaricidal Activity Screening of Medicinal Plants Used for Schistosomiasis Treatment in Atwima-Nwabiagya District, Ashanti Region, Ghana. *Journal of Parasitology Research*. <https://doi.org/10.1155/2023/6707157>
20. Augustine S. Brah, Francis A. Armah, Collins Obuah, Samuel A. Akwetey, Christian K. Adokoh (2023). Toxicity and therapeutic applications of citrus essential oils (CEOs): a review. *International Journal of Food Properties*. <https://doi.org/10.1080/10942912.2022.2158864>
21. Isaac Tabiri Henneh, Wisdom Ahlidja, John Alake, Hakeem Mohammed, Stephen Oppong Boapeah, Augustine Kwabil, Fynn Malcolm, Francis Ackah Armah (2022). Acute toxicity profile and gastroprotective potential of ethanolic leaf extract of *Manihot esculenta* Crantz. *Scientific African*. <https://doi.org/10.1016/j.sciaf.2022.e01284>
22. Isaac Kingsley Amponsah, Abena Boakye, Emmanuel Orman, Francis Ackah Armah, Lawrence Sheringham Borquaye, Silas Adjei, Yaa Afrakoma Dwamena, Kennedy Ameyaw Baah, Benjamin Kingsley Harley (2022). Assessment of some quality parameters and chemometric-assisted FTIR spectral analysis of commercial powdered ginger products on the Ghanaian market. *Heliyon*. <https://doi.org/10.1016/j.heliyon.2022.e09150>
23. Mustapha A. Ahmed, Elvis O. Ameyaw, Francis Ackah-Armah, Desmond O. Acheampong, Peter K. Gathumbi, Michael B. Adinortey, George Ghartey-Kwansah, Hope R. Otsyina, Christian K. Adokoh (2022). In Vitro and In Vivo Toxicological Evaluation of *Avicennia africana* P: Beauv. (Avicenniaceae) Leaf Extract in a Rat Model. *Journal of Toxicology*. <https://doi.org/10.1155/2022/3434383>
24. Isaac Tabiri Henneh, Wisdom Ahlidja, John Alake, Augustine Kwabil, Mustapha Abubakar Ahmed, Baffour Kyei-Asante, Michael Buenor Adinortey, Martins Ekor, Francis Ackah Armah (2022). *Ziziphus abyssinica* root bark extract ameliorates paracetamol-induced liver toxicity in rats possibly via the attenuation of oxidative stress. *Toxicology Reports*. <https://doi.org/10.1016/j.toxrep.2022.10.012>
25. Francis Ackah Armah, Isaac Tabiri Henneh, John Alake, Wisdom Ahlidja, Benjamin Amoani, Eric Gyamerah Ofori, Baffour Asante-Kyei, Gbadamosi Ismail Temitayo, Christian Kweku Adokoh (2021). *Allanblackia floribunda* Seed Extract Attenuates the Ethanol-Induced Gastric Ulcer in Rats via the Inhibition of TNF- α and INF- γ Levels and Modulation in the Expression of Ki67 Protein. *BioMed Research International*. <https://doi.org/10.1155/2021/6694572>
26. Isaac Tabiri Henneh, Francis Ackah Armah, Elvis Ofori Ameyaw, Robert Peter Biney, Ernest Obese, Eric Boakye-Gyasi, Emmanuel Awintiig Adakudugu, Martins Ekor (2021). Analgesic Effect of *Ziziphus abyssinica* Involves Inhibition of Inflammatory Mediators and Modulation of KATP Channels, Opioidergic and Nitrenergic Pathways. *Frontiers in Pharmacology*. <https://doi.org/10.3389/fphar.2021.714722>
27. Philip Kobla Atchoglo, Isaac Kingsley Amponsah, Patrick Valere Tsouh Fokou, Benjamin Kingsley Harley,

Michael Kwesi Baah, Francis Ackah Armah, Silas Adjei (2021). Anti-mycobacterium ulcerans activity and pharmacognostic standardisation of *Pycnanthus angolensis* (Welw) Warb. *Scientific African*. <https://doi.org/10.1016/j.sciaf.2021.e00935>

28. Francis Ackah Armah, Isaac Tabiri Henneh, Isaac Kingsley Amponsah, Robert Peter Biney, Fynn Malcolm, John Alake, Wisdom Ahlidja, Mustapha Abubakar Ahmed, Christian Kweku Adokoh, Genevieve Etornam Adukpo, Desmond Omane Acheampong, Peter K. Gathumbi (2021). Antidepressant and Anxiolytic Effects and Subacute Toxicity of the Aerial Parts of *Psychotria ankasensis* J.B.Hall (Rubiaceae) in Murine Models. *Evidence-based Complementary and Alternative Medicine*. <https://doi.org/10.1155/2021/5543320>
29. Mustapha A. Ahmed, Elvis O. Ameyaw, Francis Ackah-Armah, Desmond O. Acheampong, Benjamin Amoani, Paulina Ampomah, Emmanuel A. Adakudugu, Christian K. Adokoh (2021). In vitro and In vivo antimalarial activities of *Avicennia africana* P. Beauv. (Avicenniaceae) ethanolic leaf extract. *Journal of Traditional and Complementary Medicine*. <https://doi.org/10.1016/j.jtcme.2021.11.004>
30. John Alake, Samuel A. Akwetey, Wisdom Ahlidja, Francis A. Armah, Isaac Kingsley Amponsah (2021). Indigenous Knowledge Affords Antimicrobial Plants for the Management of Infections. *International Journal of TROPICAL DISEASE & Health*. <https://doi.org/10.9734/ijtdh/2021/v42i330441>
31. Desmond Omane Acheampong, Ninette Owusu-Adzorah, Francis Ackah Armah, Enoch Aninagyei, Ernest Amponsah Asiamah, Ama Kyeraa Thomford, William Kofi Anyan (2020). Ethnopharmacological evaluation of schistosomicidal and cercaricidal activities of some selected medicinal plants from Ghana. *Tropical Medicine and Health*. <https://doi.org/10.1186/s41182-020-00205-y>
32. Isaac Kingsley Amponsah, Francis Ackah Armah, John Alake, Benjamin Kingsley Harley, Elikplim Kwesi Ampofo, Evelyn Asante-Kwatia, Bill Clinton Aglomasa, Benjamin Amoani, Isaac Tabiri Henneh (2020). In-vitro Anti-cercarial activity of extracts and steroidal alkaloids from the stem bark of *Holarrhena floribunda* (G. Don) Dur. & Schinz. *International Journal of Phytomedicine*. <https://doi.org/10.5138/09750185.2415>
33. Elikplim Kwesi Ampofo, Isaac Kingsley Amponsah, Evelyn Asante-Kwatia, Francis Ackah Armah, Philip Kobla Atchoglo, Abraham Yeboah Mensah (2020). Indigenous Medicinal Plants as Biofilm Inhibitors for the Mitigation of Antimicrobial Resistance. *Advances in Pharmacological and Pharmaceutical Sciences*. <https://doi.org/10.1155/2020/8821905>
34. Isaac T. Henneh, Boshi Huang, Faik N. Musayev, Rana Al Hashimi, Martin K. Safo, Francis A. Armah, Elvis O. Ameyaw, Christian K. Adokoh, Martins Ekor, Yan Zhang (2020). Structural elucidation and in vivo anti-arthritis activity of β -amyrin and polypunonic acid isolated from the root bark of *Ziziphus abyssinica* HochstEx. A Rich (Rhamnaceae). *Bioorganic Chemistry*. <https://doi.org/10.1016/j.bioorg.2020.103744>
35. Francis Ackah Armah, Desmond O Asante (2019). Chemical profile and. *Toxicology reports*. <https://cir.nii.ac.jp/crid/1872835442639094016>
36. Christian K. Adokoh, Du-Bois Asante, Desmond O. Acheampong, Yohei Kotsuchibashi, Francis A. Armah, Ignatius H. Sirikiyi, Keisuke Kimura, Edward Gmakame, Sey Abdul-Rauf (2019). Chemical profile and in vivo toxicity evaluation of unripe *Citrus aurantifolia* essential oil. *Toxicology Reports*. <https://doi.org/10.1016/j.toxrep.2019.06.020>
37. Benjamin Amoani, Ben Gyan, Francis A. Armah, Cecil Otabil, Kofi Tchum, Margaret T. Frempong, Michael D. Wilson (2019). Comparative Analysis of Haematological Parameters in Hookworm and *Plasmodium falciparum* Co-Infected Individuals in Kintampo North Municipality, Ghana. *International Journal of TROPICAL DISEASE & Health*. <https://doi.org/10.9734/ijtdh/2018/v34i430101>
38. Desmond O. Acheampong, Isaac K. Barffour, Alex Boye, Ernest A. Asiamah, Francis A. Armah, Christian K. Adokoh, Joy F. Oluyemi, Benjamin Adrah, Richard Opoku, Emmanuel Adakudugu (2019). Histoprotective Effect of Essential Oil from *Citrus aurantifolia* in Testosterone-Induced Benign Prostatic Hyperplasia Rat. *Advances in Urology*. <https://doi.org/10.1155/2019/3031609>
39. Francis A. Armah, Benjamin Amoani, Isaac T. Henneh, Rita A. Dickson, Christian K. Adokoh, Isaac K. Amponsah, Cecilia Adu-Gyamfi, Desmond O. Acheampong (2019). In vitro Cercaricidal Activity of Fractions and Isolated Compounds of *Erythrophleum ivorense* (Fabaceae) Root Bark against *Schistosoma haematobium*. *International Journal of TROPICAL DISEASE & Health*. <https://doi.org/10.9734/ijtdh/2018/v34i330093>
40. Alex Adjei Amankwaah, Richard Opoku, Christian Adokoh, Alex Boye, Ernest Asiamah, Francis Armah,

Mawuena Tsegah, Samuel Adomako (2018). Prevalence and Antimicrobial Susceptibility Pattern of *Neisseria gonorrhoeae* in Kumasi, Ghana. *Journal of Advances in Microbiology*. <https://doi.org/10.9734/jamb/2018/42157>

41. I Henneh, E Ameyaw, F Armah, E Obese, Martins Ekor (2018). Ziziphus abyssinica hydro-ethanolic root bark extract attenuates acute inflammation possibly through membrane stabilization and inhibition of protein denaturation and *West African Journal of Pharmacy*. <https://www.wapcpjournal.org.ng/index.php/home/article/download/463/291>
42. Francis A. Armah, Isaac K. Amponsah, Abraham Y. Mensah, Rita A. Dickson, Paul A. Steenkamp, Ntakadzeni E. Madala, Christian K. Adokoh (2017). Leishmanicidal activity of the root bark of *Erythrophleum Ivoire* (Fabaceae) and identification of some of its compounds by ultra-performance liquid chromatography quadrupole time of flight mass spectrometry (UPLC-QTOF-MS/MS). *Journal of Ethnopharmacology*. <https://doi.org/10.1016/j.jep.2017.09.030>
43. KINGSLEY AMPONSAH, Francis Ackah Armah, EK Ampofo (2017). Pharmacognostic and physico-chemical investigation of *Palisota hirsuta* (K. Schum)(Commelinaceae). *Journal of Pharmacognosy and Phytochemistry*. <https://scholar.google.com/scholar?cluster=9365676758549083912&hl=en&oi=scholar>
44. Yaw Opoku-Boahen, GE Adukpo, FA Armah (2016). Anti-inflammatory and antioxidant activities of canthinone alkaloids from *Anthostema aubryanum* (Baill). *Nat Prod Plant Resour*. https://www.researchgate.net/profile/Malcolm-Fynn/publication/302328395_Anti-inflammatory_and_antioxidant_activities_of_canthinone_alkaloids_from_Anthostema_aubryanum_Baill/links/5731fd7108ae9ace84047656/Anti-inflammatory-and-antioxidant-activities-of-canthinone-alkaloids-from-Anthostema-aubryanum-Baill.pdf
45. Francis Sarpong, Francis Armah, Isaac Amponsah, Philip Atchoglo (2016). Antinociceptive Ecdysteroids and Other Constituents of *Palisota hirsuta* K. Schum (Commelinaceae). *Journal of Applied Pharmaceutical Science*. <https://doi.org/10.7324/japs.2016.601020>
46. FRANCIS ACKAH Armah (2016). Bioactive anti-leishmanial agents: prospect of the Ghanaian biodiversity. *Kwame Nkrumah University of Science and Technology, Ghana*. <https://scholar.google.com/scholar?cluster=16095240338138809881&hl=en&oi=scholar>
47. Isaac Kingsley Amponsah, Emmanuel Orman, Abraham Yeboah Mensah, Francis Mainoo Sarpong, Francis Ackah Armah, Linda Mensah Sarpong (2016). Development and validation of a radical scavenging antioxidant assay using potassium permanganate. *Journal of Scientific and Innovative Research*. <https://doi.org/10.31254/jsir.2016.5202>
48. Benjamin Amoani, Elvis Ofori Ameyaw, Du-Bois Asante, Francis Ackah Armah, James Prah, Collins Paa Kwesi Botchey, Johnson Nyarko Boampong (2015). Effect of pre-existing *Schistosoma haematobium* infection on *Plasmodium berghei* multiplications in imprinting control region mice. *Asian Pacific Journal of Tropical Biomedicine*. <https://doi.org/10.1016/j.apjtb.2015.03.007>
49. Francis A. Armah, Kofi Annan, Abraham Y. Mensah, Isaac K. Amponsah, Derek A. Tocher, Solomon Habtemariam (2015). *Erythroivorensin*: A novel anti-inflammatory diterpene from the root-bark of *Erythrophleum ivore* (A Chev.). *Fitoterapia*. <https://doi.org/10.1016/j.fitote.2015.06.001>
50. J Adotey, FA Armah (2013). Isolation, identification and biological activity of 1-hexacosanol from the leaves of *Launaea taraxacifolia* (Willd) Jeffery, Asteraceae. *Journal of Basic & Applied Sciences*. https://www.researchgate.net/profile/John-Adotey/publication/340967740_Isolation_Identification_and_Biological_activity_of_1-Hexacosanal_from_the_leaves_of_Launaea_taraxacifolia_Willd_Jeffery_Asteraceae/links/5ea81231299bf1dcb09eb8b4/Isolation-Identification-and-Biological-activity-of-1-Hexacosanal-from-the-leaves-of-Launaea-taraxacifolia-Willd-Jeffery-Asteraceae.pdf

Reports 1

1. Akwasi Acheampong, AFA Marfo, A Brobbey, AO Antwi, MK Baah, Francis Ackah Armah (2021). Scientific African. *Scientific African*. https://www.researchgate.net/profile/Temitope-D-Timothy-Oyedotun/publication/356402866_Household_Waste_Generation_Change_in_Waste_Composition_and_the_Exposure_to_COVID-19_in_Guyana_and_Nigeria/links/619fb8b1d7d1af224b241a9b/Household-Waste-Generation-Change-in-Waste-Composition-and-the-Exposure-to-COVID-19-in-Guyana-and-Nigeria.pdf

[_sg%5B0%5D=started_experiment_milestone&origin=journalDetail](#)