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Paper: **"Niveau de contamination des produits maraîchers par les métaux lourds issus des décharges sauvages dans le district d'Abidjan (Côte d'Ivoire)"**

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Peer review:

Reviewer 1: Bosson Antoine Kouame
Université Nangui Abrogoua Abidjan Côte d'Ivoire

Reviewer 2: Sivanadane Mandjiny
University of N. Carolina at Pembroke, USA

Reviewer 3: Blinded

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Reviewer Name: Bosson Antoine KOUAME	
University/Country: Côte d'Ivoire	
Date Manuscript Received: 23 /07/2025	Date Review Report Submitted: 29/07/2025
Manuscript Title: Niveau de contamination des produits maraîchers par les décharges sauvages du district d'Abidjan (Côte d'Ivoire)	
ESJ Manuscript Number: 0744/25	
You agree your name is revealed to the author of the paper: yes	
You approve, your name as a reviewer of this paper, is available in the "review history" of the paper: You approve, this review report is available in the "review history" of the paper:	

Evaluation Criteria:
Please give each evaluation item a numeric rating on a 5-point scale, along with a thorough explanation for each point rating.

Questions	***Rating Result*** [Poor] **1-5** [Excellent]
1. The title is clear and it is adequate to the content of the article.	**5**
The title describes the work done well.	
2. The abstract presents objects, methods, and results.	**4**
Yes, the summary clearly describes all the essential parts of the work, starting with the objectives, the methods used and finally presenting the main results obtained.	
3. There are a few grammatical errors and spelling mistakes in this article.	**2**
There are unfortunately enough errors of various types that will have to be corrected before this very important article can be published.	
4. The study methods are explained clearly.	**4**
Yes, the study methods are clearly described and explained.	
5. The results are clear and do not contain errors.	**4**

The results obtained using the sampling and analysis methods are clear and correct.	
6. The conclusions or summary are accurate and supported by the content.	**4**
The summary and conclusion of this study are well-addressed and quite explicit for a good understanding of this study.	
7. The references are comprehensive and appropriate.	**3**
The cited references are quite appropriate, recent and understandable for this study	

Overall Recommendation (mark an X with your recommendation) :

Accepted, no revision needed	
Accepted, minor revision needed	**X**
Return for major revision and resubmission	
Reject	

Comments and Suggestions to the Author(s): Authors must make the effort to write while avoiding mistakes that can devalue their work well done.

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Please respond within the appointed time so that we can give the authors timely responses and feedback.

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Date Manuscript Received: July 31, 2025	Date Review Report Submitted: August 5, 2025
Manuscript Title: Niveau de contamination des produits maraîchers par les décharges sauvages du district d'Abidjan (Côte d'Ivoire)	
ESJ Manuscript Number: 31.44.07.2025	
You agree your name is revealed to the author of the paper: No	
You approve, your name as a reviewer of this paper, is available in the "review history" of the paper: No You approve, this review report is available in the "review history" of the paper: No	

Evaluation Criteria:
Please give each evaluation item a numeric rating on a 5-point scale, along with a thorough explanation for each point rating.

Questions	***Rating Result*** [Poor] **1-5** [Excellent]
1. The title is clear and it is adequate to the content of the article.	**4.5**
The title "Niveau de contamination des produits maraîchers par les décharges sauvages du district d'Abidjan (Côte d'Ivoire)" (Level of contamination of market garden produce by uncontrolled dumps in the Abidjan district (Ivory Coast)) is clear and accurately reflects the study's focus on the contamination of vegetables grown near illegal dumps in Abidjan. The title is descriptive and specific. Consider specifying **trace metals/heavy metals** and the **study period** to increase precision and discoverability (e.g., "…by trace metals near uncontrolled dumps…").	
2. The abstract presents objects, methods, and results.	**4.5**
The abstract is structured to include the study's objective, methods, and key findings. It begins by stating the purpose of the study, which is to improve food safety in Côte d'Ivoire and	

demonstrate the risks of consuming crops grown near uncontrolled dumps. It then describes the materials and methods, including the types of samples collected (soil and produce) and the analytical technique used (atomic absorption spectrophotometry). The abstract concludes with the results, detailing which metals were found in the soil and which vegetables were contaminated.

3. There are a few grammatical errors and spelling mistakes in this article.	**4**

Yes, there are a few grammatical errors and they should be corrected.

4. The study methods are explained clearly.	**4**

The methods section, "Matériels et méthodes," provides a detailed explanation of the study area, the plant materials used (basil, onion leaves, lettuce, and cassava tubers), and the sampling process. It specifies the number of soil and produce samples collected, the duration of the sampling period (November 2024 to July 2025), and the locations within the Abidjan district. The document also clearly describes the sample preparation for analysis, including the drying, grinding, and sieving processes, as well as the mineralization and solubilization steps. The analytical method, atomic absorption spectrophotometry, is identified, and the calculation of the Pollution Index (IP) is explained with the formula provided. Statistical analysis methods are also mentioned. The methods are explained clearly and in a logical sequence. However, I have a few comments.

Strengths

- Sites are named; produce and soil were sampled; time window given (Nov 2024–Jul 2025).
- Sample preparation (drying, sieving to 62.5 µm fraction) and **wet digestion** (HNO_3/$HClO_4$) are described.
- Instrumentation is identified (AAS, SPECTRAA 220 VARIAN GTA 110).
- A Pollution Index (PI) is defined conceptually, and statistics (one-way ANOVA; Duncan at 95%) are mentioned.

Needed clarifications

- **Sampling design & representativeness:**
  - Soil: composite of 15 subsamples/500 g is noted, but **depth**, **grid/transect logic**, and **replicate structure** are unclear.
  - Produce: **field replication** per species/plot, **plant part homogenization**, and **market-representative harvesting** should be stated explicitly.
- **Quality assurance/quality control (QA/QC):**
  - No information on **method blanks**, **certified reference materials**, **spikes/recoveries**, **duplicate analyses**, **calibration ranges**, **R^2**, or **limits of detection/quantification (LOD/LOQ)**. These are essential for trace-metal claims.
- **Units & limits:**
  - Food limit values are attributed to **AFNOR U44-41 / FAO-WHO**, but a consolidated **table of limits per metal per matrix** (leafy vegetables vs tubers) is needed, with **citations and years**. Selenium is reported in samples, but **no limit value** is shown in tables (a dash appears); explain or cite why.
- **Digestion safety/perchloric use:** $HClO_4$ requires a **perchloric hood**; add a brief safety note and whether a **HNO_3-H_2O_2** alternative was considered.
- **Statistics:**

- Specify **factors** used in the ANOVA (site, distance, crop, metal) and whether data met **normality/homoscedasticity** assumptions or were **transformed**.
- Justify the use of **Duncan** vs. other multiple-comparison procedures; report **F-statistics**, **df**, and **p-values** (or at least compact letter displays tied to those tests) in the tables.

5. The results are clear and do not contain errors.	**4**

The results section, "Résultats," is well-structured and presents the findings. The Pollution Index (IP) values for each site are explicitly stated and compared against the threshold of 1 (IP > 1 indicates pollution). The document also presents detailed tables (Tableaux 2-5) for each study site, showing the concentrations of various metals in the different market garden products. The tables are well-formatted, include standard deviations, and compare the measured values against established limit values. The text highlights which metals exceeded the limit values for each crop and at which distances from the dump sites. The results appear to be precise and are consistently presented.

Issues to address

- **Formatting/consistency:** decimal commas vs points vary; maintain **one style** (journal preference).
- **Selenium:** reported in some leaves, but **no comparator limit**; clarify whether detection is simply reported or assessed against a standard.
- **Arsenic/Chromium/Cobalt:** mentioned as present in soils in the abstract but **not consistently followed through** in produce tables or discussion; ensure **alignment** across sections.
- **Significant figures:** SDs of ±0.001 with n=3 can look over-precise for AAS at low concentrations; consider **sig-fig** rationalization to match method LOD/LOQ.
- **Letters for multiple comparisons:** Ensure letters truly reflect **post-hoc tests within each row** (metal × distance) and specify **n**. Some rows include "–" (not determined); clarify how these were treated statistically.
- **Reference to standards:** When stating "> limit," explicitly point to the **limit table** (metal, matrix) and citation.

6. The conclusions or summary are accurate and supported by the content.	**4.5**

The conclusions are an accurate and concise summary of the findings. They reiterate that the Pollution Index (IP) was used to evaluate soil toxicity and that the highest IP values were found in Cocody, followed by Bingerville, Abobo, and Port-Bouet. The conclusion correctly states that the levels of trace metals were higher in soils closer to the uncontrolled dumps. It accurately reports that while the vegetables contained essential minerals like iron, zinc, and manganese within safe limits, they also accumulated toxic heavy metals such as arsenic, lead, nickel, and cadmium. The final summary statement, suggesting the consumption of produce from uncontaminated sites as a solution, is directly supported by the study's findings.

Consider adding one **actionable public health note** (e.g., risk-mitigation options such as **buffer distances**, **soil remediation/raised beds**, **source separation of waste**, or **washing/processing efficacy** if relevant literature exists).

7. The references are comprehensive and appropriate.	**4**

The references section, "Références bibliographiques," appears to be comprehensive and relevant to the study. The list includes a wide range of sources, such as articles from

international journals, theses, and online articles, spanning various years (e.g., 1990, 2002, 2005, 2013, 2021, 2022, 2023). The cited works cover topics such as heavy metal pollution in soil and plants, agricultural practices, and the effects of heavy metals on human health, which are all pertinent to the study's scope. The references are used to support specific claims and comparisons within the discussion section.

- Add **authoritative, current** food-metal standards (e.g., **Codex/FAO-WHO**, **EU 2023/915** for maximum levels in foods, where applicable) and **recent reviews** on heavy-metal uptake in urban horticulture.
- Verify all **AFNOR** references (correct code, year, and whether it applies to **soil** vs **food**).
- Standardize **reference formatting** (journal names, volume/issue, pages, capitalization, diacritics).

Overall Recommendation (mark an X with your recommendation) :

Accepted, no revision needed	
Accepted, minor revision needed	**X**
Return for major revision and resubmission	
Reject	

Comments and Suggestions to the Author(s):

The article is well-written and well-structured, with a clear focus on a relevant public health issue in the Abidjan district. The methodology is robust, and the results are presented logically. However, there are a few minor points for improvement. The title, while clear, could be slightly more impactful by including the specific heavy metals studied, which would give the reader a more detailed understanding of the contamination without having to read the abstract. Additionally, while the discussion section references several studies from different countries, a more direct comparison with similar studies in Côte d'Ivoire, when available, could strengthen the local context of the findings. The authors could also consider adding a section on the potential health implications for the local population consuming these contaminated vegetables, as this is a key takeaway from the study. The current mention is brief, and a more detailed discussion could increase the impact of the paper.

Comments and Suggestions to the Editors Only: