



Commentary note

Commentary on: Identification of bacterial pathogens isolated from smoked blue whiting fish (*Micromesistius poutasou*) from Odeomu market in Osun state, Nigeria

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Abstract

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Commentary note

The article by [Aladejanna et al. \(2023\)](#) explored a significant area of public health by identifying bacterial pathogens isolated from smoked blue whiting fish (*Micromesistius poutassou*) sourced from the Odeomu market in Osun State, Nigeria. Smoked blue whiting fish, commonly referred to as "Panla fish", are widely available in many open markets across Southwestern Nigeria ([Odeyemi, 2016](#)). There are various preservation methods for fish, such as freezing, salting, sun-drying, oven-drying, fermentation, and smoking ([Fitri et al., 2022](#)). However, [Aladejanna et al. \(2023\)](#) did not mention frying as part of the traditional methods for preserving fish alongside smoking for direct consumption. Indigenous people of the Southwest believe that smoked fish is more nutritious and has better flavor and texture, extending its shelf life ([Odeyemi, 2016](#)). The benefits of processing fish and fish products depend on the processing method and the quality of the raw ingredients used, which can help prolong the shelf life of perishable items, mainly through frying techniques ([Tiwari et al., 2011](#)).

I strongly agree that water and fish, as food sources, can be common vehicles for transmitting foodborne diseases and have been documented as sources of bacterial and fungal infections in humans. However, it is important to note that fish itself is not the source of these diseases; instead, the contaminated fish poses a risk ([Nyenje and Ndip, 2013](#)). This assertion should be made clear to avoid the misconception that "panla" *M. poutassou* could serve as a source of diseases. I disagree with [Aladejanna et al. \(2023\)](#) regarding their assertion that there is a lack of information on antimicrobial susceptibility testing, and the presence of resistant genes necessitated their current study. Firstly, no background information was provided by [Aladejanna et al. \(2023\)](#) on the resistance of bacterial pathogens that harbor resistant genes from the literature. Secondly, the aim of the study as presented does not connote the content of the study.

It is my candid view that this sentence should be put in a better perspective as "lack of information on drug-resistant bacterial pathogens harboring resistant genes isolated from fish in Nigeria prompted the current study," and the aim of the study should be "to assess the microbial quality of smoked blue whiting fish (*M. poutassou*) and evaluate the presence of antibiotic-resistant bacteria and their resistance genes." The sample size used by Aladejanna et al. (2023) was relatively small, with only ten fish samples from different sellers, which may not fully represent the broader market conditions or variations in microbial contamination across different regions. It is worth noting that Aladejanna et al. (2023) stated that fish previously smoked overnight and brought to the market were purchased in batches from the market: one fish sample was picked at random from ten different mongers. Consequently, knowing the criteria for selecting one fish per monger is difficult. Picking at least two to three fish from each monger across ten different mongers would have paved the way for sampling spread and a representative analysis (Andrade, 2020). Furthermore, I entirely concurred with the pour plate method of isolating bacteria listed. However, how were the authors comfortable using Nutrient Agar without some selective media for the identified pathogens? For example, Salmonella-Shigella Agar (SSA) or other selective media should have been used for *Salmonella* species and *Shigella* species, Eosin methylene blue Agar for *E. coli*, Mannitol Salt Agar for *Staphylococcus* species, etc. (Cheesbrough, 2020).

The use of the Analytical Profile Index (API) 20E for members of *Enterobacteriales* and API 20NE for non-*Enterobacteriaceae* should usually add to the quality and correct identity of the isolates reported. Interestingly, 99 bacterial isolates were obtained from 10 different sample sources. However, information on the coexistence of 2 or more bacterial pathogens isolated from each of the smoked fish analyzed was lacking. This information is crucial to public health because contamination of smoked fish by different pathogens, when consumed, could culminate in host-pathogen dynamics and disease severity in humans depending on the pathogens involved (Adamu-Governor et al., 2023). Additionally, while the study focused on identifying specific pathogens and resistance genes, it should also explore other factors that

could influence microbial contamination, such as fishmonger handling practices and environmental conditions during storage and transportation (Fitri et al., 2022).

The study did not clearly define the multiple drug resistance (MDR). At the same time, I agree that some pathogens resist many antibiotics. Evaluated as mentioned by the authors, the resistance of bacterial isolates to at least one agent in three or more antimicrobial categories should be considered MDR (Magiorakos et al., 2012). I also concurred that the multiple antibiotic resistance (MAR) index of greater than 0.2 recorded in their study for all the bacteria isolates indicated that the bacterial pathogens are likely to be from high-risk sources and originated from an environment where several antibiotics have been used.

Antibiotic-resistant pathogens in commonly consumed food items like smoked fish raise concerns about food safety and public health in Nigeria and similar regions where such practices are common. The potential for these bacteria to cause outbreaks of foodborne illnesses calls for immediate attention from health authorities and policymakers. The assertion that all smoked fish from open markets may be unsafe could be misleading. Therefore, acknowledging variability in handling and processing practices among different vendors would provide a more nuanced perspective (Odeyemi, 2016). Hence, fresh, adequately smoked fish with reduced moisture, as a ready-to-eat food processed under good hygienic environments in local markets, should not be discouraged, particularly when comparative impact assessments on the microbial quality of different smoked fish with varying moisture contents have not been conducted. Instead, attention should be focused on how the outcomes of the study performed by Aladejanna et al. (2023) could provide valuable insights into improving food safety practices and consumer education. Although the recommendations by the authors are practical, they could be expanded to include more detailed strategies for improving hygiene and reducing contamination risks, such as specific training programs for fish handlers. This will go a long way in reducing foodborne illnesses associated with contaminated smoked fish consumption.

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