

Does the Hand Bacteria Level on College Campuses Differ from the General Public?



Antiggonie M. Sabulsky, Hannah J. McKillen, Joseph M. Marcelli, Allison C. Cambier and Advisor, Dr. Gore-Panter

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INTRODUCTION

When preparing for college, students are required to have certain vaccinations. Additionally, college health is emphasized because of the close quarters of students, faculty, and staff. The main vector for the spread of bacteria and other pathogens is the hand. However, do the levels differ enough from the general public to warrant the concern for college health? Are college campuses “cleaner” than the general public? What factors affect these levels?

OBJECTIVES

- Determine an general average level of hand bacteria.
- To establish a general level of hand bacteria on college campuses.
- Determine differences between campus levels and general population’s levels.

METHODS

- A literature review was performed on academic journals garnered from the Michael Schwartz library’s database and searches through google scholar.
- Relevant articles and journals focusing on bacteria levels on the hand and skin were selected as the foundation of evidence.
- Statistics, graphs, and results were used to create averages for general and college populations.
- The determined levels will be compared.

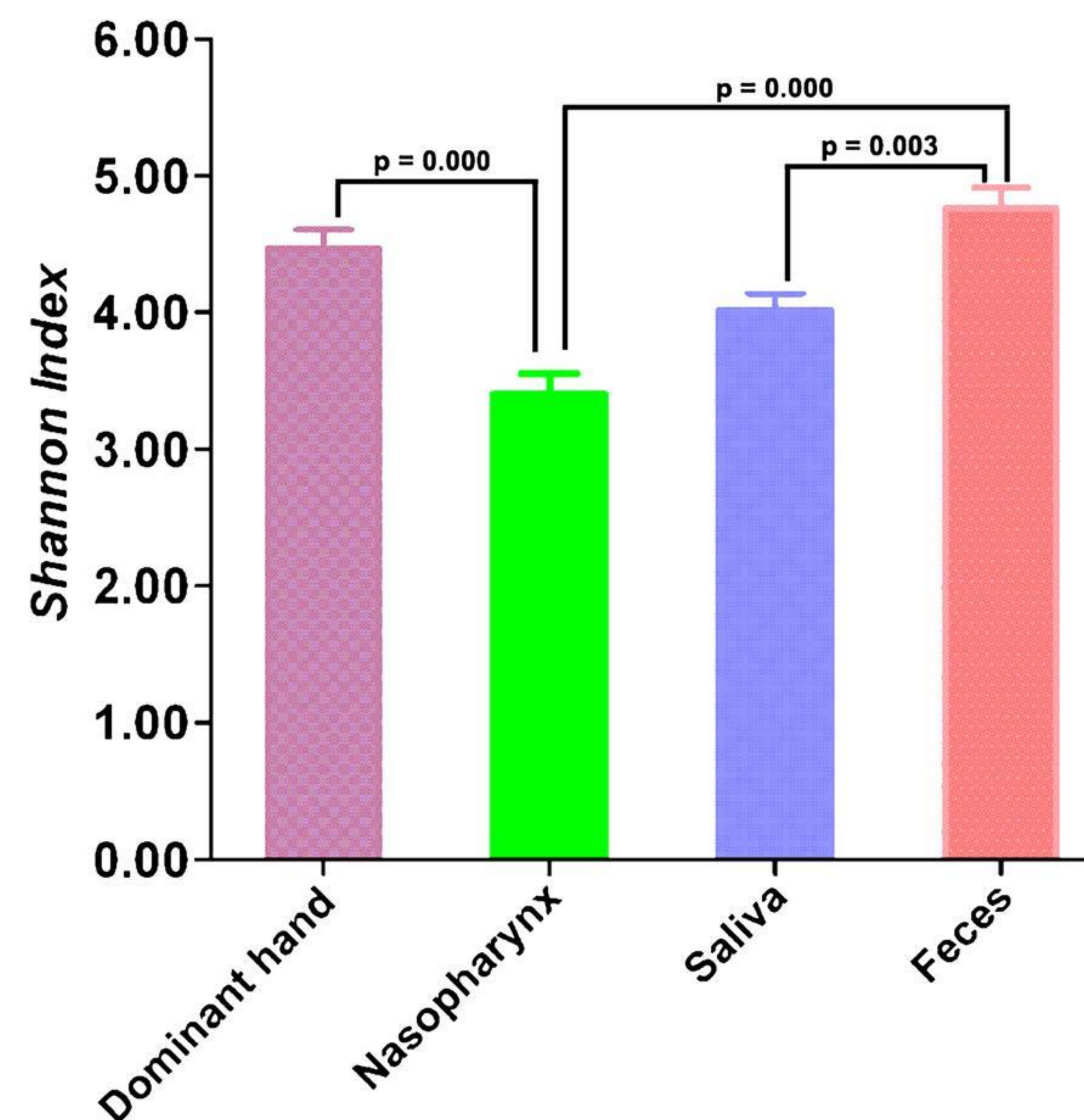


Figure 1., Shannon Diversity Index analysis of bacteria from several sources including the dominant hand (T. Buggy, 2007).

RESULTS

- Figure 1 shows Compares the Shannon Diversity index value between dominant hand, nasopharynx, salvia, and feces in a university in China (T. Buggy, 2007).
- Four bacteria (*F.AB109769*, *Strep. mitis*, *C. tuberculostearicum*, *P. acnes*) were present in 100% of the general population sample, three (*Staph. Hominis*, *Staph. epidermidis*, *A. junii*) in 83%, nine (*D. nitroreducens*, *C. jeikeium*, *R.mucilaginoso*, *Strep. sanguinis*, *A. AY770698*, *P. stutzeri*, *C. amycolatum*, *C. mucifaciens*, *Staph. caprae*) in 63% (Michael Wilson, 2008).
- Other general bacteria presence: *Corynebacterium spp.* 50-79% on the right hand, *Staph. epidermidis* 50-79% on the right hand (Michael Wilson, 2008).
- Dominant hand diversity estimates using pyroseqeuencing analysis was found to be 5.28, determined as Shannon diversity index. (T. Buggy, 2007)

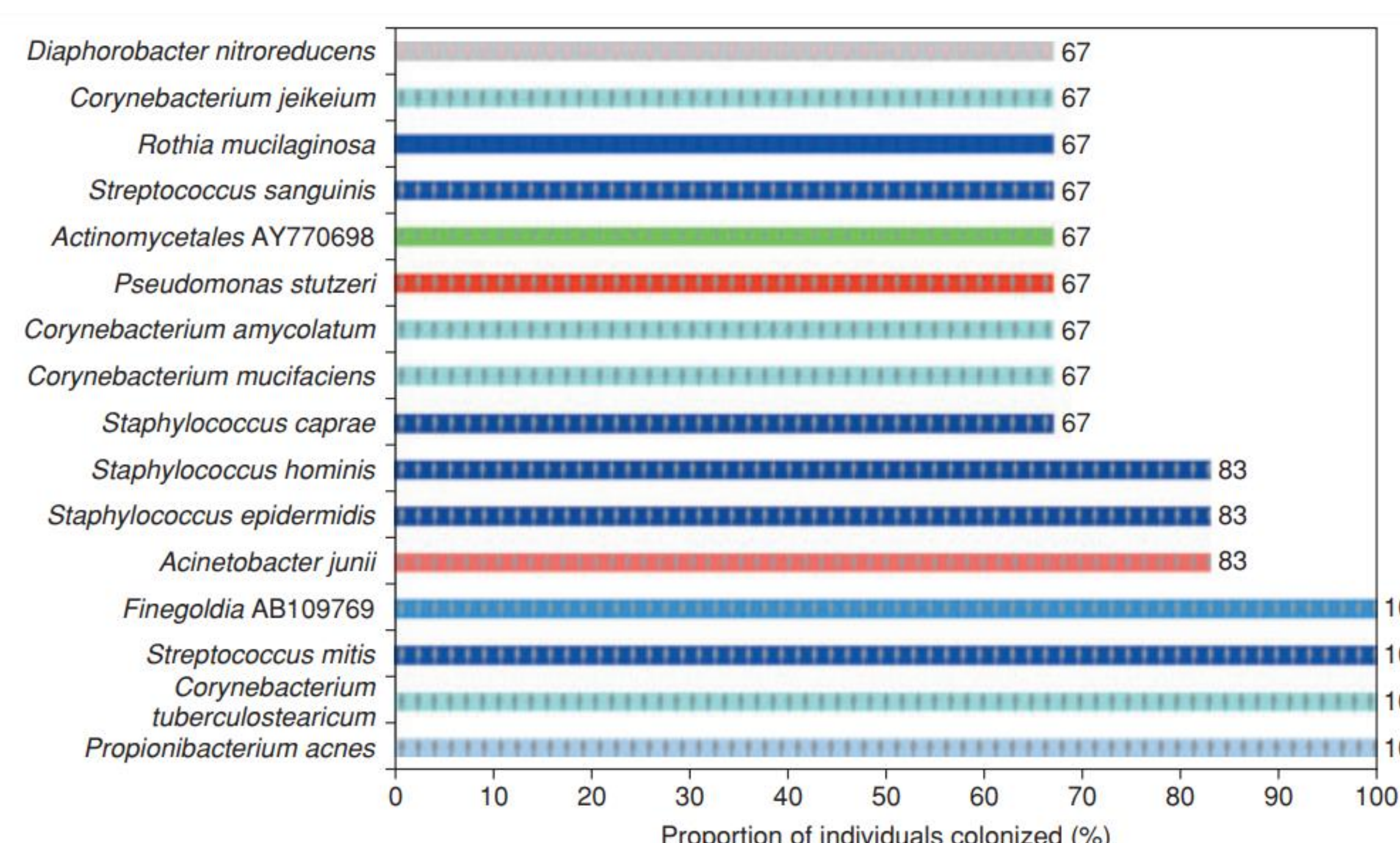


Figure 2. Culture-independent analysis of the microbiota from forearms of six healthy adults (Michael Wilson, 2008).

DISCUSSION

Two major factors that could impact the statistics gathered are the methods in which the bacteria levels were determined. The bacteria levels from the general population were found using culture-independent methods. Where gene sequencing was used to determine the Shannon Diversity index on college student’s hands.

Another is the uniformity of college campus populations may affect the bacteria populations that exists across the community. Similar diets, health habits, and lifestyles of college students impact bacterial fauna (T. Buggy, 2007).

CONCLUSIONS

Based on the gathered statistics, there are 4 types of bacteria present in 100% of the general population and are 3 present in 83% concluding the average level of diversity of bacteria is a range of 4-7 types. The lowest average consists of 4 bacteria: *F.AB109769*, *Strep. mitis*, *C. tuberculostearicum*, *P. acnes*. The levels of diversity between campus and general populations are equal, or the general population’s level is greater. The Shannon Diversity index on a college student’s hand ranges from 4 to 5.28. The level of bacteria on college campus is equal and/or slightly lower than that of the general population.

FUTURE WORK

Future work would entail our group swabbing Cleveland State students hand in a popular area of campus, like the Inner-link, and comparing the types of bacteria and levels to other college campuses in big cities, and to Cleveland’s demographics as well. We will do this to see if Cleveland bacteria levels are lower or higher than other similar cities.

References

- Buggy, T. (2007, Summer). Storyboard for Ivan’s morning routine. Diagram. *Journal of Positive Behavior Interventions*, 9(3), 151. Retrieved December 14, 2017, from Academic Search Premier database.
- Wilson, Michael. *Bacteriology of Humans : An Ecological Perspective*, John Wiley & Sons, Incorporated, 2008. ProQuest Ebook Central