Summary

Title of Minor Project:

MICROBIAL ANALYSIS OF TOOTH PASTES FROM HOUSEHOLDS BELONGING TO VARIOUS SOCIO-ECONOMIC STRATAS IN SANGLI.

UGC File NO: F. 47-501 / 2012, dated 07/03/2013

The present study was designed to investigate and check the count of normal micro flora of various tooth pastes, commonly used for cleaning teeth and maintaining oral hygiene, after just opening the tooth paste, for first use, on "zero" day; after using it for 15 days & after using it for 30 days, with the help of Standard Plate Count and the results have been compared. Toothpastes have been distributed for use, to households belonging to various economic strata, taking into consideration the place of living, background, culture, habits, cleanliness and hygiene, so as to observe whether these affect the number of organisms, added to the product, which is the tooth paste.

This study is significant with reference to the health of each and every human being who invariably uses tooth paste, of one or other brand, for cleaning teeth first thing in the morning and last thing at the end of the day, with an aim to maintain oral health and freshness of the breath. This study is aimed at qualitative and quantitative analysis of the various tooth samples after their opening, periodically, to check the number and types of micro-organisms prevalent in them and draw conclusions with reference to the incidences of infections.

The present study has significant relevance to the hygiene and health problems and needs of the society.

The proposed research will lead to an information on the various aspects related to normal flora of tooth pastes, increase or decrease in the microbial counts over a period of time, its co-relation with the socio-economic status of the family from where the samples have been collected, types and numbers of organisms isolated and its probable impact on the health of individuals.

In this investigation, SPC was carried out for all twenty tooth paste samples, on the zero day of opening, after fifteen days and thirty days had passed after opening and using it every day. Almost all samples show organisms in the given toothpaste samples. Since it is an oral health

product, there should be no micro-organisms in "0" day sample but the samples show a viable count in terms of org/ml on the zero day, after 15th day and on 30th day.

Household wise distribution of samples show counts as below;

25% of the samples were distributed to LIG households, **45%** to MIG and **30%** to HIG households.

Samples A, B, E, F, G were distributed in Low Income Group households, samples C, D, H, L, M, N, O, Q, R in Middle Income Group Households and samples I, J, K, P, S, T in High Income Group households.

It was observed that in;

LIG: samples I, J, K and T show same counts on "0, 15 and 30th days" while samples P and S show increasing counts.

MIG: sample N shows the same count on "0, 15 and 30th days", while all others show increasing counts.

HIG: sample B shows the same count on "0, 15 and 30th days" while A, E, F and G show increasing counts.

Not much relation is observed in the type of SPC of LIG, MIG and HIG distributed samples but it has been observed that day "0" shows a high count in all samples. The count either remains the same or goes on increasing.

Analysis for microbial load of the toothpastes in the Abuja open markets shows that they were all sterile as no bacterial or fungal isolates were identified and this shows that the microbial quality of toothpaste formulations marketed in Abuja, has met the drug standard which excludes the presence of the index, indicator or pathogenic organism in drugs, to be consumed by the populace (Okpalugo et al, 2009). Oral swabs from 12 students of Novena University, Ogume were collectively analyzed for their total viable bacteria counts and predominant isolates were also identified, with two toothpastes via close up, Aqua fresh. In the mouths of volunteers before toothpastes treatment there were bacteria such as *Streptococcus* species, K*lebsiella* species. *Streptococcus* species were the predominant bacteria flora. Encountered also were the *Staphylococcus, Klsebsiella Species* and *Proteus* species which were also present on all mouth swabs were found to be affected by the paste treatments. The work therefore suggests that these toothpastes effectively reduce the total bacterial load of the mouth (Otoikhian and Okoror, 2012).

Further study needs to be done, using controls for every sample, to check if status of households has an impact on the air microflora, which may add to the samples, when they are being squeezed out of the tubes.

Besides, various morphological types of Gram positive and Gram negative bacteria are observed in the tooth paste samples on "0, 15 and 30" days after opening them.

Various conclusions can be drawn from this study;

- None of the tooth paste samples show "0" count immediately after opening the paste, which is expected.
- Various morphological types of Gram positive and Gram negative bacteria are observed in the tooth paste samples on "0, 15 and 30" days after opening them.
- Microbial count goes on increasing with the period interval, showing that it is a better idea to use small volume tooth pastes than large, family size tubes.
- In most households, microbial count remains constant for a definite period, not showing an increase, which may be related to cleaner environments and better hygienic standards.
- Oral diseases or infections may be related to the high incidence of Gram positive and Gram negative bacteria present in the tooth paste samples.
- Presence of spore bearers indicates a dangerous situation where pathogens are practically irremovable

After opening a new tooth paste in a house hold, for daily use, its microbial count increases may be due to various factors like improper handling, storage, etc. As the days go by, this count increases, by 15^{th} day and 30^{th} day. This may be responsible for incidences of oral or respiratory tract infections. Quantitative and qualitative analysis of the samples, at periodic intervals, of 15 days, gives a clearer picture of the situation, with reference to the nature of micro organisms developing in them.

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P. Investigator

Details of Publications

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Paper Publications:

1. Comparative assessment of various treatment methods used for purification of water", Proceedings of UGC sponsored National Conference "Chemistry and its role in human development", Dept of Chemistry, Dr. PKM, Sangli 2013, 26th March, 2013, **ISBN 978-8L-925021-0-6**, pp 32-36.
2. *Curcuma longa* and *Allium sativum* as prebiotics, Bionano Frontier, Vol 6 (2), July – December 2013, 327-329. **ISSN 0974-0678/ 2320-9593**, Impact Factor 4.856, Indian Science Abstract, CSIR, MAPA, IF
3. Comparative evaluation of response of burn wound pathogens medicinal plant extracts and standard antibiotics, Vol.3, Issue 7, Aug 2013, Golden Research Thoughts Journal, IF 1.2018, **ISSN 2231-5063,** 1-3.
4. Neem, an invaluable bioresource", International Journal of Pharma and Biosciences, ijpbs, Int J Pharm Bio Sci 2013 Oct; 4(4): **ISSN 0975-6299,** 606-612, IF 5.121
5. An antimicrobial wonder plant – Aloe vera, Bionano Frontier, July – December 2013, Vol 6 (3), 49-51. **ISSN 0974-0678/ 2320-9593**, Impact Factor 0.045, Indian Science Abstract, CSIR, MAPA
6. Role of an NGO in the upliftment of AIDS affected children in Sangli district: a microbiologists' perspective", Indo-Mauritius Journal, September 2014, 1 (1), Current Research in Biochemistry and Microbiology, PP 64-74, **ISBN 978-93-5030-212-5**
7. Conservation of Biodiversity with reference to indigenous herbal therapeutic agents", Feb 2014, Journal of Applied and Environmental Microbiology, @ Science and Education Publishing, USA, http://pubs.sciepub.com/jaem/2/2/2, Vol 2, no. 2, 42-45. **ISSN (Print):** 2373-6747, **ISSN (Online):** 2373-6712
8. Friendly microbes – The solution to pollution?" Inspire Vidnyan Bharati – pp 56-58, INSPIRE 2014, **ISBN 978-81-925021-2-0**
9. Global warming and medicinal aromatic plants, proceeding of National Conference RTFPM -2014", 3rd and 4th Oct 2014, 228-236, **ISBN 97881927211-9-2**
10. Prospecting medicinal plants as human health promoting agents", proceedings of ICBB 2014, International Conference on Biotechnology and Bioengineering, on 29th and 30th Oct 2014, at Dubai, organized by Microbiologists society and BITS Pilani, Dubai Campus.
11. High Performance Thin Layer Chromatography analysis of bioactive components from *Curcuma longa*; an anti-microbially effective medicinal spice, American Journal of BioScience, Jan 2015, 3 (1-1), 1-6, Vol 5, Issue 1, pp 1-6, Online **ISSN: 2330-0167,** @ Science and Education Publishing, USA, If 2.064, http://pubs.sciepub.com/jaem, Special Issue – Pharmacognosy wrt evaluation of medicinal plants as an alternative therapy.
12. Medicinal Plants and Rural Economy", BVDU – BVCON – 15, **ISBN – 978-81-906732-6-6**, 66-72, National Conference on Modern Trends in Rural Management

and Development – A paradigm shift, organized by BVU's IMRDA, Sangli, 2^{8th} Feb and ^{1st} March, 2015.

13. Pattern of susceptibility of Staphylococus aureus from clinical samples from Sangli, Maharashtra, to standard antibiotics and medicinal plant extracts", ICCRCLS - 15, Bionanofrontier, **ISSN 0974-0678, online 2320-9593,** Vol 8, Issue 3, Apr 2015, 50-54.
14. Role Of Taxonomy With Reference To Research In Microbiology, National Conference On Recent Advances And Applications Of Taxonomy In Life Sciences, UGC and YC Science college, Satara, 6th and 7th Oct 2015
15. Flavonoids - the magical components of medicinal plants, ChemXpress, Volume 9, Issue 2, Pages 139-144 , Oct 2015, ISSN (Online):2320-1975
16. Isolation, characterization and study of bacterial isolates from dairy effluent, UGC Sponsored on National Seminar on "Role of Microbial Technology in Sustainable Agriculture : Challenges and Opportunities", souvenir, 44-49, ISBN 978-93-81432-87-7, 31st Oct 2015.
17. Role Of Information Science In Microbiology, Changing trends in Library and Information Science, Souvenir, ISBN 978-81-924895-1-3, 94-97, December 2015

Paper Presentation in Conferences:

1. Biodiversity with reference to indigenous herbal therapeutic agents", 7th Sept 2013, National conference, "Environment Biodiversity: Challenges, Conservation and Preservation", pp 37-44, ISBN 978-81-925021-1-3, UGC and Dr. Patangrao Kadam Mahavidyalaya, Sangli.
2. Conservation of medicinal plants, an important component of bio-diversity", UGC sponsored National conference on "Frontiers in Chemical and Biological Sciences, PDVP college, Tasgaon, 23rd and 24th Sept, 2013.
3. An antimicrobial wonder plant – Aloe vera", Oral paper presentation, UGC National Conference on "Microbiology horizons in Biomedical Sciences", Dept of Microbiology, Rayat Shikshan Sanstha's, Karmaveer Bhaurao Patil College, Vashi, New Bombay, Maharashtra, 27th, 28th Sept 2013.
4. Imbibing Research Culture amongst Under-graduate Microbiology students", NAAC sponsored State level conference on "Role of Research, Consultancy and extension in Higher Education", PDVP college, Tasgaon, 29th and 30th Nov, 2013.
5. Comparative response of common bacterial pathogens to commonly prescribed standard antibiotics and few medicinal plants extracts, UGC sponsored International conference in Microbiology, "Emerging Horizons in biochemical sciences and nano-materials – EHBCSN-13", Shri Shivaji Science college, Barshi, 28th, 29th and 30th Nov, 2013.
6. Soil Salinity- A major threat to agriculture in Sangli region: Its present scenario and future prospects, poster at UGC sponsored International conference in Microbiology, Science college, Barshi, 28th, 29th and 30th Nov, 2013.
7. Azotobacter: A promising biotechnological agent, poster at UGC sponsored International conference in Microbiology, Science college, Barshi, 28th, 29th and 30th Nov, 2013.
8. Application of Lipolytic bacteria for bioremediation of fat, oil and grease contaminated waste water", poster at UGC sponsored International conference in Microbiology, Science college, Barshi, 28th, 29th and 30th Nov, 2013.

9. Prospecting medicinal plants as human health promoting agents", oral presentation at ICBB 2014, International Conference on Biotechnology and Bioengineering, on 29th and 30th Oct 2014, at Dubai, organized by Microbiologists society and BITS Pilani, Dubai Campus.
10. Role of Microbes in global economy", SU, KOP, UGC, Dr PKM, 25th Silver Jubilee, National Annual conference in Economy, "Payabhoot Sanrachana – Ek Mulyamapan, Maharashtrateel shet jaminicha wapar – Samasya ani Upaay yojana"conference, 10th and 11th January, 2015.
11. Pivotal role of women in global economy scenario", ICSSR, New Delhi, One Day National Seminar (Inter Disciplinary) on Gender Equality and Development in Modern India, SNDT , Sangli, 16th Jan 2015.
12. Advantages of bacterial alginates over algal alginates" DST – PURSE sponsored National level competitions in Bio Sciences (Bio Comp - 2015), organized by dept of Microbiology, SU KOPwith Microbiologists Society, India, 30th Jan, 2015.
13. Medicinal Plants and Rural Economy", BVDU – BVCON – 15, National Conference on Modern Trends in Rural Management and Development – A paradigm shift, organized by BVU's IMRDA, Sangli, 28th Feb and 1st March, 2015.
14. Pattern of susceptibility of *Staphylococcus aureus* from clinical samples from Sangli, Maharashtra, to standard antibiotics and medicinal plant extracts", 2015, International Conference on Contemperory research in chemical and life sciences, SGM college Karad and Shivaji University, Kolhapur, 22ND and 23RD April, 2015.
15. Role Of Taxonomy With Reference To Research In Microbiology, National Conference On Recent Advances And Applications Of Taxonomy In Life Sciences, UGC and YC Science college, Satara, 6th and 7th Oct 2015
16. Role Of Information Science In Microbiology, in National seminar on Changing trends in Library and Information Science, UGC and DPKM, Sangli, 30th Dec 2015

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