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Short Article

P-Tonic Toxicity and Microbial Studies

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Abstract: ***Aim:***This study was conducted to assess the toxicity and microbial studies of an herbal product ***P-Tonic*** formulated by one student studying Naturopathic and Holistic Medicine at Nyarkotey College of Holistic Medicine. ***Method:*** Six (6) samples of P-Tonic were sent to the Kwame Nkrumah University of Science and Technology, KNUST, Ashanti region, Ghana to the Department of Herbal Medicine for analysis ***Result:*** The Product, P-Tonic have been established for quality control purposes and is safe in laboratory animals. No harmful microorganisms were detected. ***Conclusion:*** The Product is safe for use in Ghana.
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Keywords: P-Tonic, Mixture, Health, Toxicity, Herbal, Product.

METHODOLOGY & FINDINGS

Tab 1 Phytochemical and Physicochemical Study

P – Tonic		
Name	-	P – Tonic
Indication	-	Not Stated
Active Ingredients	-	Not Stated
Date Of Manufacture	-	Not Stated
Date Of Expiry	-	Not Stated
Batch Number	-	Not Stated
Produced By	-	Redeemer Herbal Clinic And Research Centre Ltd.
1.Organoleptic Properties		
Form	-	Liquid
Colour	-	Brown
Taste	-	Bitter
Odour	-	Characteristic
2. Physicochemical Properties		
Ph	-	5.62
Dry weight per Ml	-	0.1638g
Specific gravity/Ml	-	0.9889
3. Phyochemical Properties		
Reducing sugars	-	Positive
Saponins	-	Positive
Alkaloids	-	Not detected
Flavonoids	-	Positive

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Phytosterols	-	Positive
Terpenoids	-	Positive
Tannins	-	Positive

Tab 2

4. Fourier-Transform Inrared Fingerprint Of P– Mixture

Sample preparation: About 20mL of the herbal mixture was evaporated to dryness.

Instrumentation: A small amount of the dried mixture was placed on the sample area of the Bruker Fourier transform infrared (FT-IR) spectrometer and scanned between 4000-400cm-^{1} with a resolving power of 4cm-^{1} and a cumulative scanning limitation of 24times.

Results: Principal peaks appeared at wavenumbers 3302.92 (broad), 2921.90, 2851.45, 1611.37 and 1315.57 cm-^{1}

Comments: Fourier-Transform Infrared (FT-IR) Fingerprint of P - Tonic has been established for reference.

Remarks

Characteristic physiochemical properties of P - Tonic have been established for quality control purposes.

Tab 3

Table 3 Acute Toxicity

Animal Species	No. of animals/group	Route of administration	Doses administered	No. of death Recorded	Approx. lethal dose	Duration of study
Sprague-Dawley Rats	18 males, 3 groups (n=6)	oral	0, 6.25 and 12.5g/kg	No deaths recorded	Above 12.5 g/kg	48h

Remarks

A volume of 750ml of the mixture was evaporated to dryness to obtain a semi-solid mass (Yield=2.73%w/v) this was reconstituted by dissolving in distilled water (2g/ml). Rats were treated with 0, 6.25 and 12.5g/kg of the test product and observed over 48hours for signs of toxicity.

None of the animals died during the study period and no signs of toxicity attributable to the test product treatment were observed. The lethal dose (LD50) of the product was estimated to be above 12.5g/kg (Table 1).

CONCLUSION

The results indicate that the LD50 of the extract from P-Tonic was greater than 12.5g/kg body weight in rats. Which can be regarded as of low toxicity in the rats.

Tab 4

Microbial Analysis of R-Mixture	
Microbial Test Protocol-(BP Level of Microbial Contamination)	
i. Assessment of total viable count of aerobic bacteria and fungi)	
ii. Test for specific harmful organisms.	

TEST RESULTS

Level of Microbial Contamination

1. The total aerobic viable count of sample (BP 2018 Specification- - ≤ 1 x 10^5 cfu/mL	2.54x10^2 cfu/mL
2. Test for Escherichia coli- MAC /37°C/48hrs (BP 2018 Specification- Nil/ML)	None detected
3. Test for Staphylococcus aureus-MSA/37°C/48hrs	None detected

(BP 2018 Specification-Nil/ML)

4. Test for Salmonella spp. BSA/37°C/48hrs None detected
(BP 2015 Specification - Nil/mL)
5. Test for Pseudomonas aeruginosa PCA/37°C/48hrs None detected
(BP 2015 Specification - Nil/mL)

6. Test for Yeast and Moulds - SB/25°C/5days
(BP 2015 Specification - $\leq 1.0x10^5$ cfu/mL) 1.34×10^2 cfu/mL

REMARKS

1. The bacterial load obtained for aerobic viable count was within the acceptable limit.
2. The fungal load was also within the acceptable limit (BP 2015).
3. No harmful microorganisms were detected.

DISCUSSION

The product P-Tonic contains important phytochemicals such as: saponins, Flavonoids, Tannins and Alkaloid is the only phytochemical absent in the product (**Tab 1**). it is safe to be used and has successfully passed the toxicological and microbial analysis conducted.

None of the laboratory rats died in the process (**Table 3**). Toxicity of Herbal products are a subject of both local and international interest in the health sector as more patients turned to these remedies for their health. Toxicity of herbal products Pharmacovigilance for complementary medicines is at the gestational stage (Barnes, J. 2003). Data are lacking in several areas relevant to safety. Standard pharmacovigilance tools have additional limitations when applied to investigating safety concerns with complementary medicines. It is therefore paramount for all herbal medicinal products to get tested and approved by the FDA in Ghana before commercialization.

CONCLUSION

The Product, P-Tonic is safe and has successfully passed the toxicological and microbial analysis conducted at the Kwame Nkrumah University of Science and Technology, KNUST, Ashanti Region, Ghana.

Conflict of Interest
none

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