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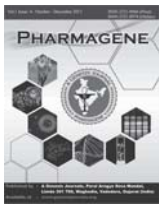

"A Herbal PH Indicator From Bracts Extract Of Bougainvillea Spectabilis"

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Abstract:

Today synthetic indicators are the choice for the acid base titrations. Most of these indicators are organic dyes and are of synthetic in origin. Today synthetic indicators are the choice of acid-base titrations, but due to environmental pollution, availability and cost, the search for natural eco friendly herbal compounds as an acid-base indicator are the need of the hour. Herbal compounds could be used as herbal indicators. The present work highlights the use of the ethanolic extract of the bracts of Bougainvillea spectabilis as a pH indicator in acid-base titrations. Bougainvillea spectabilis commonly known as "Paper Flower" is belonging to family Nyctaginaceae. This natural indicator is easy to extract and it is also easily available. Herbal indicators are evaluated as indicator for weak acid-strong base titrations based on their performance. Indicators used in titration showed well marked changes of color at certain intervals of pH (9 to 10). In all these titrations the ethanolic extract of the ?owers of Bougainvillea spectabilis was found to be very useful, economical, simple and accurate for acid base titration.

Key words: : herbal pH indicator, Bougainvillea spectabilis, acid-base titrations.

Introduction :

Bougainvillea is a very common ornamental plant grown as a shrub as well as a climber. It belongs to the family Nyctaginaceae, commonly known "Paper ?ower" owing to bracts are thin & papery. The actual ?ower of the plant is small and generally white, but each cluster of three ?owers is surrounded by three or six bracts with the bright colors associated with the plant, including pink, magenta, purple, red, orange, white or yellow.[1] which has ten species, but only three species B. spectabillis, B. glabra and B. peruniana are horticulturally important.[2] Bougainville glabra have been used by the traditional practitioner of Mandsaur in variety of disorders like diarrhea, reduces acidity, cough and sore throat decoction of dried ?owers for the blood vessels and leucorrhoea and and decoction of the stem in hepatitis.[3]

Commercial indicators are expensive and some of them have toxic effects on users and can also cause environmental pollution.[4] Although there are automated titration apparatus that determine the equivalent points between reacting species, indicators are still needed for teaching and research laboratories for simple titration.[5]

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Pigments responsible for the appearance of colors in higher plants are classi?ed in several groups as chlorophylls carotenoids (carotenes, xanthophylls); ?avonoids (chalcones, anthocyanins, ?avones, ?avonols); betalains (betaxanthin, betacyanin)[6] Many plants contain color pigments, which have been extracted and used as natural indicator are obtained from plant parts like leaves (red and purple cabbage); ?owers [geranium, poppy, rose, Antrrhium majus, hibiscus, sun?ower (Helianthus annus), Ixora coccinea, Datura stramonium, Nerium odorum, Thespesia populnea, Barbados (Caesalpinia pulcherrima), and Railroad Creeper (Ipomoea palmate)and Butea monosperma]; berries (blue barriers, blackcurrant); fruits (leman, Morus alba linn, Punica granatum, and Mangosteen skin); stems (rhubarb); rhizomes (termeric).[7-8] Phytochemically the plant has been has been attributed to contain two betacyanins. Acid hydrolysis of one of these pigments gave a crystalline mixture of the distereoisomeric aglycons, betanidin and isobetanidine.[9]

The intention behind this study is simply to bring in market the use of plant pigments and to increase the wealth of traditional medicinal system of india which is mostly plant based and to help farmers regarding cultivation, collection of plants as well as to industry regarding preparation of above indicators.[10-11] Titrate and Titrant with indicator shows sharp and intense color changes at the equivalence point that is at neutralization [12]. Therefore the objective of this work was to explore the indicator activity of methanolic extract of Bougainville spectabillis.

Material And Methods

Collection and Authentication of Plant

Fresh ?owers of Bougainvillea spectabilis were collected in November from Undirwadi village in Nashik region, Maharashtra, India, and authenticated by the Botany Department; Swami Muktanand College, University of Pune, Pune, India. A voucher specimen (No. 156) was deposited at its Herbarium.

Reagents

Analytical grade reagents i.e. Sodium hydroxide (NaOH), Potassium Hydrogen phthalate, Boric acid, Benzoic acid, Ethanol, glycerin, phenolphthalein were procured from the Research Laboratory, Mumbai. Reagents and volumetric solutions were prepared as per Indian Pharmacopoeia.[13]

Preparation of Extract

Brackts of Bougainvillea spectabilis collected from garden & Cleaned by using distilled water were triturated in ethanol in mortar and pestle then wet mass press with clean pressing apparatus then collected extract ?ltered by whattman No. 1 ?lter paper, the extract was preserved in tightly closed container and stored away from the direct sun light for use on same day.

Experimental Procedure

The calibration of apparatus burette, pipette, volumetric ?ask and other required instruments and standardization of base were done as per Indian Pharmacopoeia 1996.

10ml of titrand with two drops of each indicator (Standard & Herbal) were titrated against titrant and the color changes for the indicator and there burette readings are listed in the table1.

The assay of benzoic acid and boric acid were carried out by using indicator of titrated against titrant and color change for the indicator as well as the result of screening for weak acids and strong base are listed in Table No.1. Each titration is carried out ?ve times by using 1N strength of NaOH and results were recorded as mean ± SD.

Result And Discussion

For all type of titration equivalence point obtained by methanolic extract of Bougainvillea spectabilis exactly coincide with equivalence point obtained by standard indicator phenolphthalein. This represents the usefulness of herbal indicator in acid –base titration.

It is observed that indicator acts reversibly and gives sharp color change in both directions. The results obtained showed that the routinely used synthetic indicators could be replaced successfully by herbal indicator as they are simply available, gives accurate and precise results.

Conclusion

From above experimental data, we conclude that the Bougainvillea spectabilis herbal indicator gives good, simple, precise results same as Phenolphthalein indicator. Phenolphthalein indicator having high cost, so Bougainvillea spectabilis herbal indicator can be used instead of Phenolphthalein indicator.

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Table No. 1:
Parameters for titration

Titrant	Titrand	Indicator color change		Volume of titrant required for equivalent point with titrand (10ml) with indicator	
		Standard (Phenolphthalein)	Bract extract of *Bougainvillea spectabilis*	Standard (Phenolphthalein)	Bract extract of *Bougainvillea spectabilis*
NaOH	Potassium Hydrogen Phthalate	Colourless to pink	Pink to yellow	23.7 ml ± 0.15	23.5 ml ± 0.16
NaOH	Benzoic acid	Colourless to pink	Pink to yellow	16.5 ml ± 0.12	16.3 ml ± 0.18
NaOH	Boric acid	Colourless to pink	Pink to yellow	15.3 ml ± 0.16	17.3 ml ± 0.14

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