Antibacterial activity of Kutajarista - an Ayurvedic preparation

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Kutajarista, an antidiarrhoeal Ayurvedic formulation prepared in the laboratory using Madhuca longifolia (Koen.) Macbr. (Sapotaceae) (flowers), Holarrhena antidysenterica (Roxb. ex Fleming) Wall. (Apocynaceae) (stem bark), Gmelina arborea Roxb. (Verbenaceae) (stem bark), Woodfordia fruticosa (L.) Kurz (Lythraceae), Vitis vinifera L. (Vitaceae) (raisons) and adjuvants, viz. honey and jaggery as ingredients is screened for antimicrobial activity against Staphylococcus aureus, Proteus vulgaris, Salmonella typhi, Bacillus pumilus, Escherichia coli, Pseudomonas aeruginosa, Bacillus subtilis, Micrococcus luteus and Candida albicans; the standard preparation of Kutajarista is compared with three market samples.

Keywords: Kutajarista, Antidiarrhoeal activity, Ayurvedic preparation, Antimicrobial activity

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Herbal products including Ayurvedic medicine are available in different forms and are composed of single plant component or polyherbal formulations. The method of preparation as per classics is complicated in many cases1-3. The products available in the market is likely to vary in quality and therapeutic efficacy for the reasons, viz. differences in composition of the product, differences in methods of manufacture, differences in methods of storage, differences in geographical origin and season of plant parts collected, lack of standards for formulations, lack of adequate documentation of production and testing to name a few. The objective of the study was to standardise and evaluate the antibacterial activity of Kutajarista, which is widely used in the treatment of grahani (sprue), pravahika (dysentery) and raktatisara (diarrhoea accompanied with blood) in doses of 12-24 ml4.

Methodology

Kutajarista was prepared in the laboratory using authentic material as per Bhisajyaratnavali, (Atisaradhikara)4. The materials were thoroughly washed and shade dried for formulation preparation. The plant and their parts were processed as herbarium and crude drug specimens following standard methods5. The voucher herbarium specimens and crude drugs samples are deposited at Regional Research Institute (Ay), Bangalore (RRCBI). The Ayurvedic identification and botanical identification were carried out as per standard texts6,7. Kutajarista prepared in the laboratory was designated as the standard. Madhuca longifolia (Koen.) Macbr. flowers (Sapotaceae) from the forests of Dakshina Kannada district in Karnataka, Holarrhena antidysenterica (Roxb. ex Fleming) Wall. stem bark (Apocynaceae), Gmelina arborea Roxb. stem bark (Verbenaceae), and Woodfordia fruticosa (L.) Kurz. (Lythraceae) were collected from North Kanara forests in Karnataka; Vitis vinifera L. raisins (Vitaceae) and adjuvants, viz honey and jaggery were collected from the market.

The test organisms used for evaluation of antibacterial activity included Staphylococcus aureus, Proteus vulgaris, Salmonella typhi, Bacillus pumilus, Escherichia coli, Pseudomonas aeruginosa, Bacillus subtilis, Micrococcus luteus and Candida albicans. The antimicrobial activity was determined as per Indian Pharmacopoeia8. The bacteria were inoculated into soybean casein digest agar broth and incubated at 37°C for 4 hrs and the suspensions were checked to provide approximately 10 colony forming units per ml. The culture medium was inoculated with microorganisms suspended in soybean casein digest broth. 8 mm diameter wells were punched into the agar and filled with the product. The plates were incubated at 37°C for 18 hrs and the antibacterial
activity was evaluated by measuring diameter of inhibition zone. The samples evaluated included one authentic sample prepared in the laboratory (standard) and 3 market samples of Kutajarista from reputed companies coded as M1, M2 and M3.

Results and discussion

The details of zone of inhibition measured for various samples are presented (Table 1). All the 4 samples exhibited antibacterial activity against all organisms studied. However, the activity of standard sample prepared in the laboratory was found to be superior to other samples against all organisms evaluated. The standard exhibited maximum zone of inhibition against Proteus vulgaris followed by Bacillus subtilis. Similar action was observed against other organisms except Bacillus pumilus, where lowest zone of inhibition of 15.2 mm was recorded. The M1 market sample exhibited maximum action against Bacillus subtilis and minimum against Pseudomonas aeruginosa. M2 sample exhibited maximum activity against Proteus vulgaris and minimum against Micrococcus luteus.

Kutajarista is widely used in the treatment of grahanni (sprue), pravahika (dysentery) and raktatisara (diarrhoea accompanied with blood) and is likely to be effective due to its antimicrobial activity against the organisms associated with gastrointestinal tract. The zone of inhibition against gastrointestinal organisms such as Escherichia coli and Salmonella typhi confirms that Kutajarista is having profound antibacterial effect on these two organisms and hence effective in mitigating dysentery. This variation observed in the activity among the market samples may be due to one or more reasons such as differences in composition of the product, differences in methods of manufacture, differences in methods of storage, differences in geographical origin and season of plant parts collected, lack of standards for formulations and lack of adequate documentation of production and testing. From this perspective, it is of utmost importance to standardise classical Ayurvedic formulation and establish standards of testing to ensure uniformity and consistency in its activity and effectiveness. The method described may be used as the standard method for standardisation of each batch of Kutajarista, which ensures consistency and uniformity in the quality of the product.

A standard method based on antibacterial activity is established for testing each batch of the well known Ayurvedic formulation Kutajarista, which helps in maintaining the efficacy and quality of product. The standard is compared with three market samples.

References
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2 Gupta AD, Ashtanga Hridaya (commentary), (in Hindi), (Chaukhambha, Varanasi), 1972.
3 Sastry SN, Carakasamhita (commentary) (in Hindi), (Chaukhambha, Varanasi), 1970.

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<th>M-3</th>
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Table 1— Zone of inhibition of Kutajarista (mm)