**Mode of Purgative Action of Kutaki (Picrorhiza kurroa)-A Chemical Assay**

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Abstract
Kutaki is a well known purgative drug having Bhedana action according to Ayurveda due to which it facilitates penetration into fecal mass so that even very hard feces is softened. This study was carried out to understand the Bhedana action of the drug from modern pharmacological point of view. The results of this study showed that Kutaki possesses surface tension reducing action. It neither contains anthraquinone nor possesses swelling action. In vitro study showed that it is nonirritant purgative drug.

Key Words: Kutaki, Katuki. Picrorhiza kurroa, Surface tension reducing

Introduction:
Kutaki (Picrorhiza kurroa) is a well known purgative drug in Ayurveda. Out of the four types of actions of purgative drugs described in Ayurveda (Sharngdhara Purva 4:5), Kutaki is attributed Bhedana type of action. The drug which disintegrates the unformed (Abaddha), formed (baddha) or very hard (Pindita) form of feces (Mala) by facilitating penetration into it and then evacuate through lower gut is known as Bhedana. To understand this type purgative action of Kutaki this study was planned to evaluate the mode of purgative action of Kutaki from modern pharmacological point of view.

Aims and Objects: To study the Bhedana type action of Kutaki from modern pharmacological point of view.

Materials and Methods
Some of the seeds of drugs such as phylum, plantain or plantago swells in the intestine and acts as bulk forming laxative. To study this type of effect swelling factor of Katuki was measured. For this purpose cut rhizomes of Katuki as well as its crude powder were shaken well with the distilled water separately and kept in a graduated cylinder for 24 hours. The volume occupied pre and post 24 hours was recorded and any increase in its volume was taken as its swelling factor (Skyrine and Wallis, 1936).

Many drugs possess purgative action due to their anthraquinone content; therefore a test was also done to know its presence in Kutaki. For this test 0.1 g of Kutaki powder was boiled in 5 cc of H₂SO₄ (10%) for 3 minutes and then filtered while hot. On cooling the filtrate was shaken gently for a minute with equal volume of benzene and then allowed benzene layer to separate completely and by means of a dropper with teat, the benzene layer was carefully transferred to a clean test tube and ammonium hydroxide (10%) was added to it about half of its volume. The test tube was shaken gently and then layers were allowed to separate. If anthraquinones are present in the drug, the lower ammonium layer changes to delicate rose pink color. With Senna it may take few minutes to develop the color (Fairbairn, 1942). Certain purgative drugs act due to their irritant action; therefore an in-vitro test was also done to ascertain its irritant action.

Surface Tension: One group of purgative drugs acts due to its surface tension reducing property. To study this type of action, the solution of Kutaki in distilled water was prepared and its surface tension was tested. In this preliminary study the surface tension reducing action was determined by adopting the test used to ascertain presence of bile salts in the urine. For this purpose 5 gm of katuki was boiled in 200 ml of water for 5 minutes and on cooling it was filtered. Thus obtained solution was placed in a test tube and on the surface of it sulfur powder was sprinkled gently. If the drug possesses surface tension reducing property then the powder sinks otherwise it floats on the surface of the solution.

Irritation Effect of Katuki: The aqua solution of Katuki was put into the eyes of rabbit and observed for one hour. If the eye becomes red within this period then it is concluded that the drug has irritant action otherwise it is non irritant.

Results
1. **Swelling Factor**: 1 gm coarse powder of Katuki was well shaken in distilled water and kept in a graduated cylinder for 24 hour. No change in volume was noticed after 24 hours which showed that the drug does not possess swelling property.
2. **Anthraquinone**: Test for the presence of anthraquinine was performed as per method mentioned above. The result was negative showing that Katuki does not possess anthraquinone
3. **Irritation Effect of Katuki**: The aqua solution of Katuki was put in the eyes of rabbit and even
after one hour it did not caused redness in the eyes. This showed that Katuki is not an irritant purgative drug.

4. **Surface Tension Reducing Effect:** Solution of Kutaki powder made in distilled water was put in a test tube which was kept on a test tube stand. Carefully fine sulfur powder was sprinkled on the surface of the solution. Immediately the sulfur powder slinked into the solution. This test was repeated three times and always sulfur powder sunk into the solution. On the basis of this observation it was inferred that Kutaki possesses surface tension reducing property.

**Discussion**

Some drugs such as dioctyl sodium sulfosuccinate, dioctyl calcium sulfosuccinate and poloxalcol have purgative action due to physical property of lowering surface tension which is thought to facilitate penetration of the fecal mass by water and fats. Although those affects are produced at higher concentration of the drug than those probably achieved within the gastrointestinal tract after clinical dosage, their possible significance deserves further exploration (Goodman and Gilman, 1970).

Surface active agents act by their surface active detergent action. This promotes the formation of oil-water emulsion and thus softens stool. The prototype for the surface active agents that are employed as emollient laxative is dioctyl sodium sulfosuccinate. It is an anionic surface active agent widely used in the pharmaceutical industry as an emulsifying agent and as a wetting and dispersing agent in formulation for external application. Because of the many potential adverse effects of the mineral oil, the surface active agents are a welcome addition to the group of emollient laxatives. Its use in chronic constipation of the spastic type has resulted in effective fecal softening and the return of normal bowel function. The administration of dioctyl sodium sulfosuccinate with impaction in the megacolon and anal fissure, in bed ridden patients, especially children, appears to be very useful (Krantz and carr, 1967).

As evident from the above results Kutaki possesses surface reducing property. Due to this physical property of lowering surface tension the drug is thought to facilitate penetration of the fecal mass by water and fats. In Ayurveda Kutaki is attributed with Bhedana action which also explained to act by facilitation the penetration into the fecal mass, thus it softens the fecal mass even if very hard.

Kutaki is a very famous drug of Ayurveda materiamedica, which is being used by Ayurveda for centuries showing no adverse effect. On the contrary it has been proved to have liver protective actions in the recent studies. Therefore, it is a very important finding of this study. Further studies were carried out to evaluate the surface tension reducing effects various extracts of Kutaki which is being planned to publish shortly.

**Conclusion**

Kutaki possesses surface lowering action. The drugs due to surface lowering action facilitates penetration into the fecal mass thus softens it; which scientifically support the Bhedana action mentioned in Ayurveda for Kutaki. Kutaki does not contain anthroquinone and is nonirritant. It also does not swell in water.

**Bibliography**
