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The study of therapeutic effect of Cleome dolichostyla herbal tea on formation and dissolution of calcium oxalate renal stones by electrochemical methods.

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Abstract

***Objective**:* Present study designed to evaluate the effectiveness of an extract obtained from *Cleome dolichostyla* on calcium oxalate crystallization in vitro.

Materials and Methods: In this laboratory research, after taking the aqueous extract of 5 grams of *Cleome dolichostyla* by 100 ml of distilled water at gentle heating, the formation and dissolution of calcium oxalate in the absence and presence of extract was investigated by complexometric and conductometric methods.

Results: The effect of the extracts on the prevention of sediment formation was studied and the results of the conductometric titration curve method for leaves of *Cleome dolichostyla* showed a significant difference (175.0 µmol) between the concentration of calcuim in the absence (450.0 µmol) and presence of the extract (625.0 µmol) and for seeds, the difference was (38/0 µmol) in the absence (450/0 µmol) and presence (488/0 µmol) of the extract. In the study of the effect of extract on the stone dissolution, the results of the complexometry method showed that the amount of calcium measured by the dissolution of calcium oxalate crystals for the leaves of *Cleome dolichostyla* in the presence of extract, was 2.5 µmol higher than that in the absence of extract and for seeds was 6.0 µmol higher.

***Conclusion**:* According to this study, *Cleome dolichostyla* aqueous extract dissolves calcium oxalate kidney stone, but can not prevent the formation of them.

Key words: Cleome dolichostyla, Calcium oxalate, Complexometry titration, Conductometry, Kidney stone.

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1. Introduction

Urinary stone formation affects 10-12% of the population in industrialised countries [1]. Their prevalence has increased in recent years, while the age of onset has decreased [2]. Diet and environment play an important role in kidney stone diseases, possibly by changing the composition of the urine [3].

Renal stones have different types, including calcium oxalate, calcium phosphate, ureic acid, magnesium ammonium phosphate (Struvite) and cysteine stones, that about 75-80% of urinary stones are composed of calcium oxalate and calcium phosphate salts [4-6].Of course, other unusual kidney stones such as xanthine, dihydroxy adenine, silicate and matrix have also been reported [7-10].

However, for the treatment of patients with kidney stones, various therapies such as the use of chemical drugs or surgeries have been used, but, so far, there is no effective and safe drug treatment that results in complete treatment or prevention of stone formation. Today, because of the side effects and harmful effects of chemical drugs, the use of herbal products has attracted the attention of researchers [11-13].

In recent researches, the effects of some medicinal herbs such as *barberry*, *Nigella Sativa*, *Juniperus excelsa* and *Allium jesdanum* have been investigated in clinical or laboratory form on kidney stone [14-17]. This study was conducted to investigate the effect of *Cleome dolichostyla* extract on the formation and dissolution of calcium oxalate kidney ston. *Cleome dolichostyla* is an annual herb which grows wild in barren lands and belongs to the family *Cleomaceae*. This plant contains some mineral compounds, including Ca, Mg, Fe, Zn, Cu and Mn and fatty acids such as linoleic acid, palmitic acid, stearic acid and linolenic acid [18].

2.Materials and methods