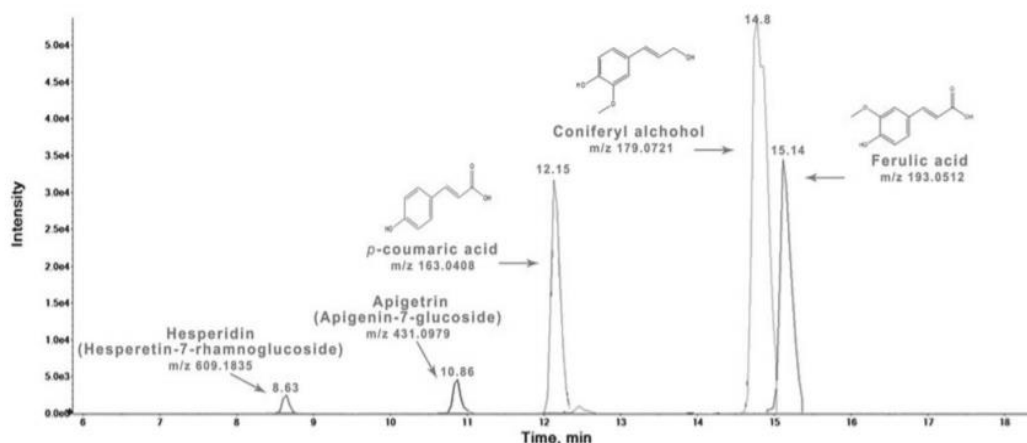


Phenolic compounds from *Lagenaria siceraria* (Calabash) could help in management of oedema, hypertension, obesity and related metabolic disorders

Scientists from DBT's Institute of Bioresources and Sustainable Development (DBT-IBSD), Imphal and Jadavpur University have studied *Lagenaria siceraria* (bottle gourd), which is a popular food plant among Indians, and contains a large number of phenolic compounds with several medicinal benefits, mentioned in Indian System of Medicine (ISM). The main objective of the study was to investigate the carbonic anhydrase inhibitory potential and inhibitory mechanism of the most potent fraction of *L. siceraria* fruits.



The extract and fraction of dried fruit of *L. siceraria* screened for their *in vitro* carbonic anhydrase II (bCA II) inhibitory activity. The active fraction was purified by using flash chromatography. The bioactive compounds were identified and quantified through liquid chromatography quadrupole time-of-flight tandem mass spectrometry (LC-QTOF-MS/MS) and reverse-phase high-performance liquid chromatography (RP-HPLC). Finally, the underlying carbonic anhydrase inhibitory mechanism of the compounds was explained by enzyme kinetics and molecular docking study.

The LC-QTOF-MS based identification of the most active fraction revealed the presence of phenolic compounds. The results of the enzyme inhibition assay revealed that coniferyl alcohol, ferulic acid and p-Coumaric acid inhibited bCA II activity [half maximal inhibitory concentration (IC₅₀) value range of 80 to 250 μM] in a dose dependent manner. The kinetics

study of enzyme inhibition revealed that p-Coumaric acid binds to the enzyme competitively whereas the non-competitive type of inhibition was observed for ferulic acid and coniferyl alcohol. The molecular docking study explored the interaction mechanism of phenolic compounds at the active site of bCA II.

The present research led them to conclude that, the phenolic compounds from *L. siceraria* serve as major contributors for carbonic anhydrase inhibition, which could play a useful role in the management of oedema, hypertension, obesity and related metabolic disorders.

Link: <https://onlinelibrary.wiley.com/doi/abs/10.1002/pca.2975?af=R>

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