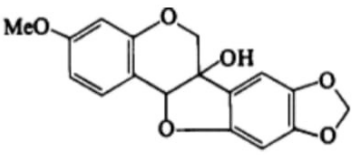
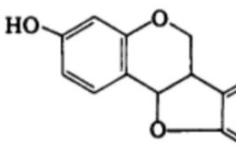
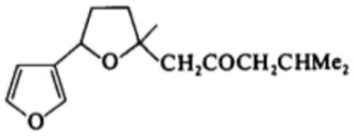
Phytoalexins



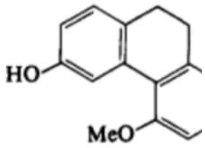
pisatin
(*Pisum sativum*, Leguminosae)



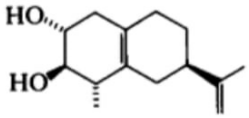
phaseollin
(*Phaseolus vulgaris*, Leg



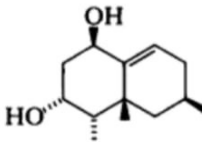
ipomeamarone
(*Ipomoea batatas*, Convolvulaceae)



orchinol
(*Orchis militaris*, Orchi



rishitin



capsidiol

In my kitchen garden, I have a vine of Momordica charantia (bitter gourd) which I like much. Despite its several known health benefits, I once used its seed extracts to kill the fungal pathogen that started to destroy another of my cucurbit plant - the pumpkin. The pathogen was established to be a strain of Fusarium solani that attacks cucurbits very commonly.

When my bitter gourd vine contracted some unknown fungal disease and started dying out, I wondered why do this gourd and other cucurbits not produce even basic phytoalexins to fight pathogens intrinsically as much as possible.

Phytoalexins are low molecular-weight small molecules which act as powerful anti-microbial agents produced reportedly by the plants of 17 angiosperm families. It is not necessary that all plants of these are able to do that. Members of Fabaceae and Solanaceae are widely known to produce these compounds as secondary metabolites. These compounds are produced de novo following pathogen attack.

Hundreds of phytoalexins are there with diverse chemical structure. Several of them are produced through the phenylpropanoid pathway of plants which also produce anthocyanin, lignin and many types of flavonoids along with them.

Phenylpropanoid pathway is also called Shikimic acid pathway. Common examples of phytoalexins produced by Shikimic acid pathway are Pisatin of pea, Phaseollin of bean, glyceollin of soybean, Kievitone of most beans etc.

A few of phytoalexins are synthesized through the Mevalonic acid pathway e.g. Rishitin of the Solanaceous plants, Gossypol of cotton, casbene of castor bean etc. Some common phytoalexins are shown in Fig.1.

Cucurbits (Cucurbitaceae) fail to synthesize any of these useful compounds like a lot of other plant families.

To know the role of phytoalexins in plant defense systems and in terms human health benefits, read the following article by Philippe Jeandet et al. (2014) - https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.mdpi.com/1420-3049/19/11/18033/pdf&ved=2ahUKEwieg9-463pAhUXyDgGHZn0C6AQFjAKeg QIDBAB &usg =AOvVaw1XVmPYrYqV6H5tvk4yqF-R&cshid=1589267653216 For further studies, you must also go through the following review article by Roop Singh et al. (2017) to have deeper knowledge of the phytoalexins. https://www.google.com/url?sa=t&source= web&rct= j&url=https://www.ijcmas.com/6-1-2017/Roop%2520Singh,%2520et%2520al. pdf&ved= 2ah UKEwieyLyR1K3pAhVYfX0KHV0eA9IQFjAKegQIAxAB&usg=AOvVaw3vpqV1Cs1wQb7 wPt30LZeI

You must write a synopsis on Phytoalexins in your words after all you read. The synopsis must not exceed 1,500 words and should be easily readable. You may also write it in Hindi if you find writing in English cumbersome or so!

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