

Chemistry of Natural Products (CHEM-6139)

Online Lectures (Sweeteners)

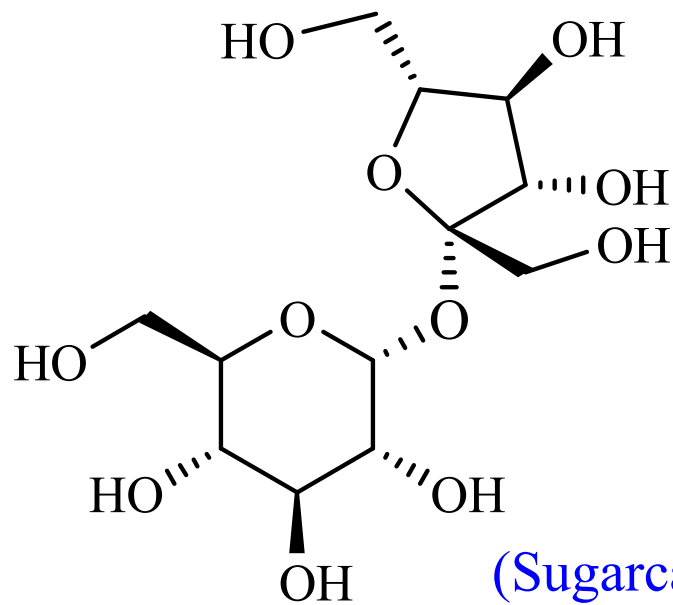
Prof Dr Abdul Rauf Raza

Professor (Tenured)

Institute of Chemistry

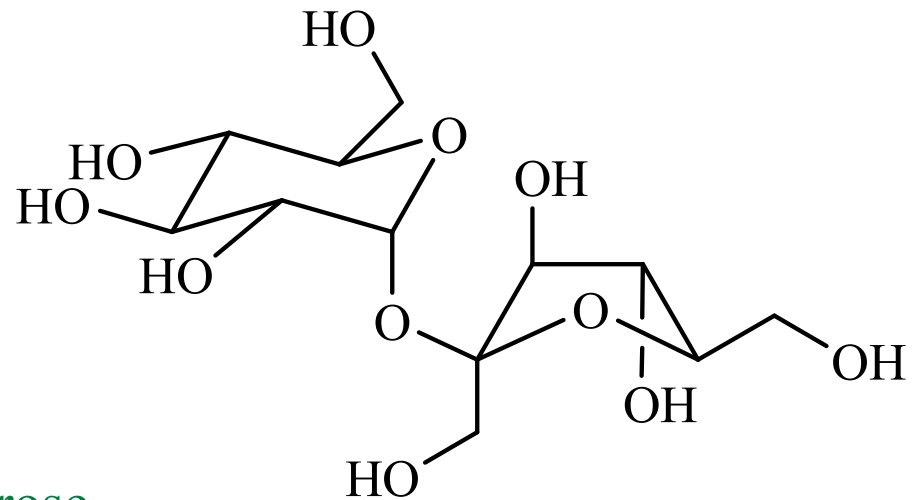
University of Sargodha, Sargodha

Sweeteners



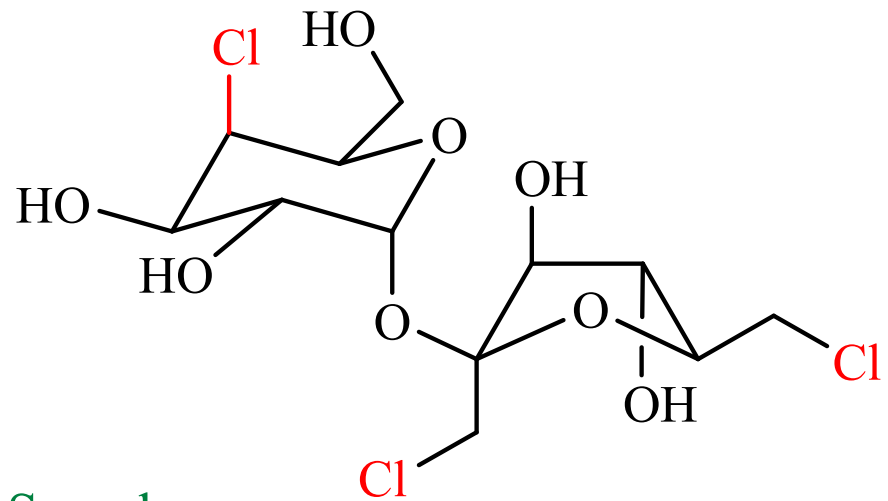
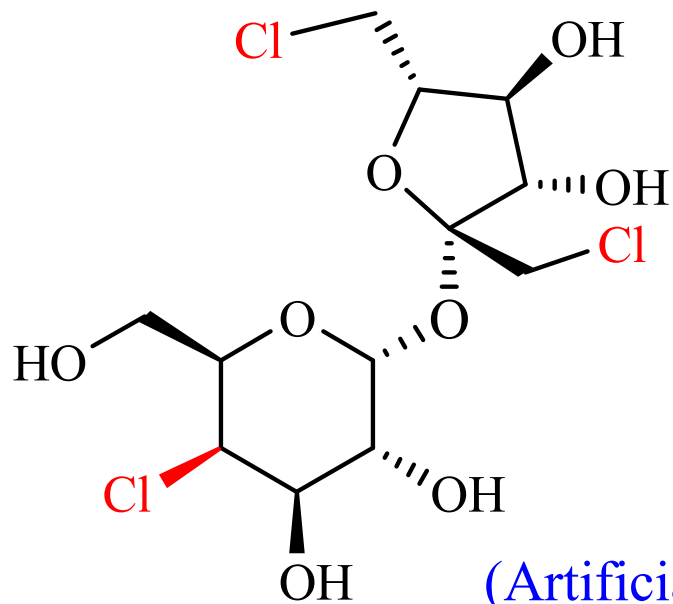
Sucrose

(Sugarcane, beet, grapes etc.)

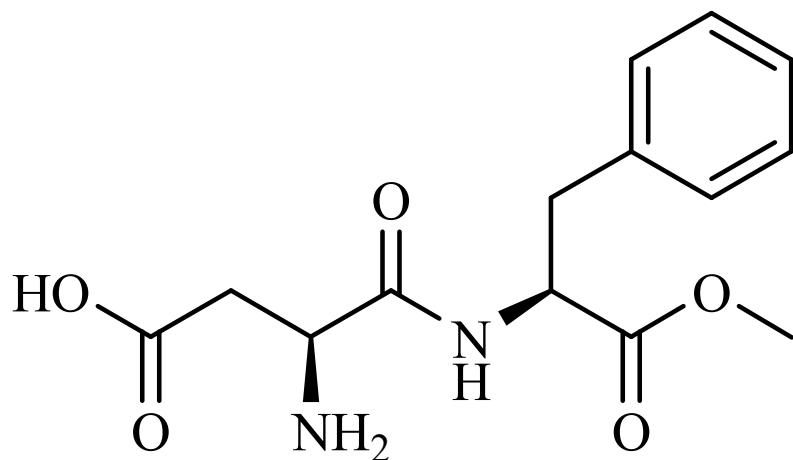


Sucralose

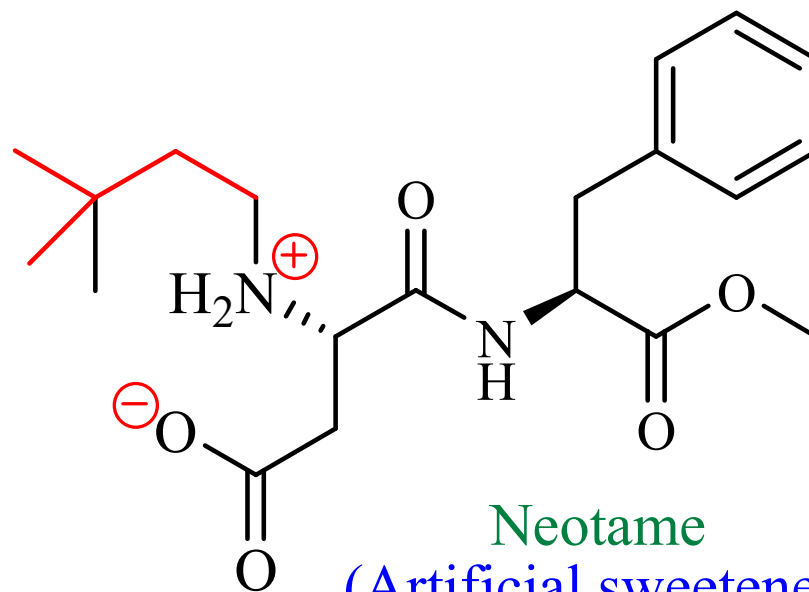
(Artificial sweetener, 600 × more sweet)



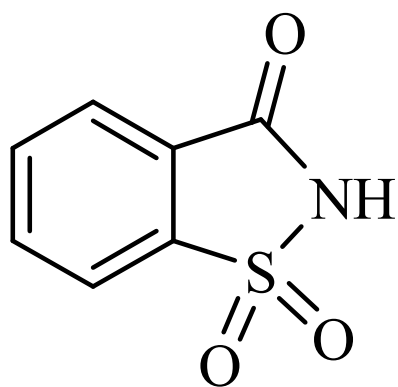
Artificial Sweeteners



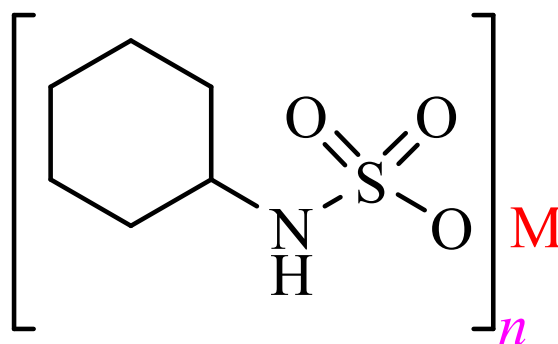
Aspartame
(Artificial sweetener,
180-200 × more sweet)



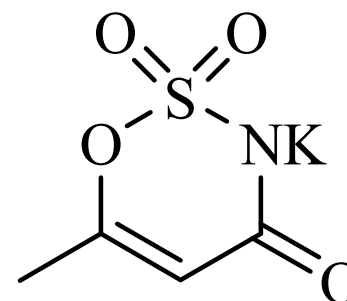
Neotame
(Artificial sweetener,
7,000-1,000 × more sweet)



Saccharin
(Artificial sweetener,
300-500 × more sweet)

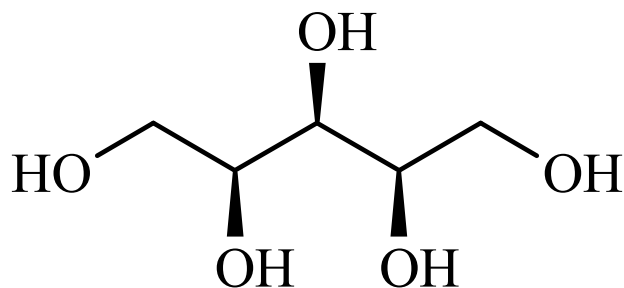


Cyclamates
(**M** = Na⁺ / Ca²⁺,
30-50 × more sweet)



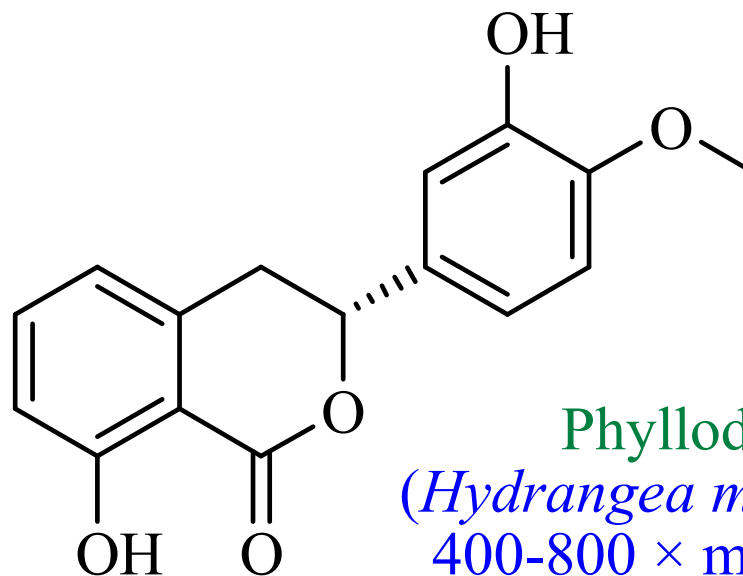
Acesulfame K
(Artificial sweetener,
200 × more sweet)

Natural Sweeteners



Xylitol

(Hydrolysis of hemicellulose
from corncob)

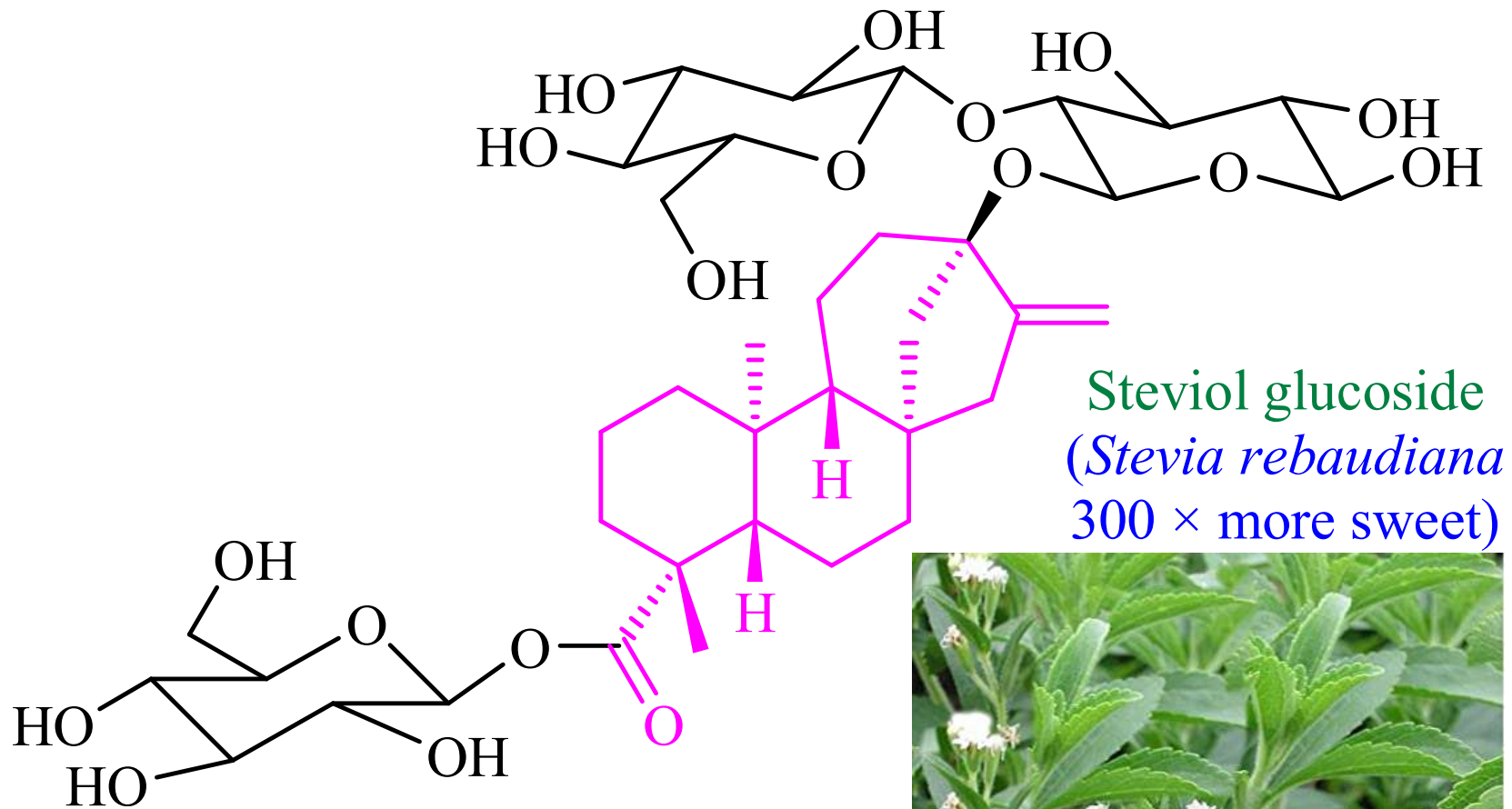


Phyllodulcin

(*Hydrangea macrophylla*,
400-800 × more sweet)

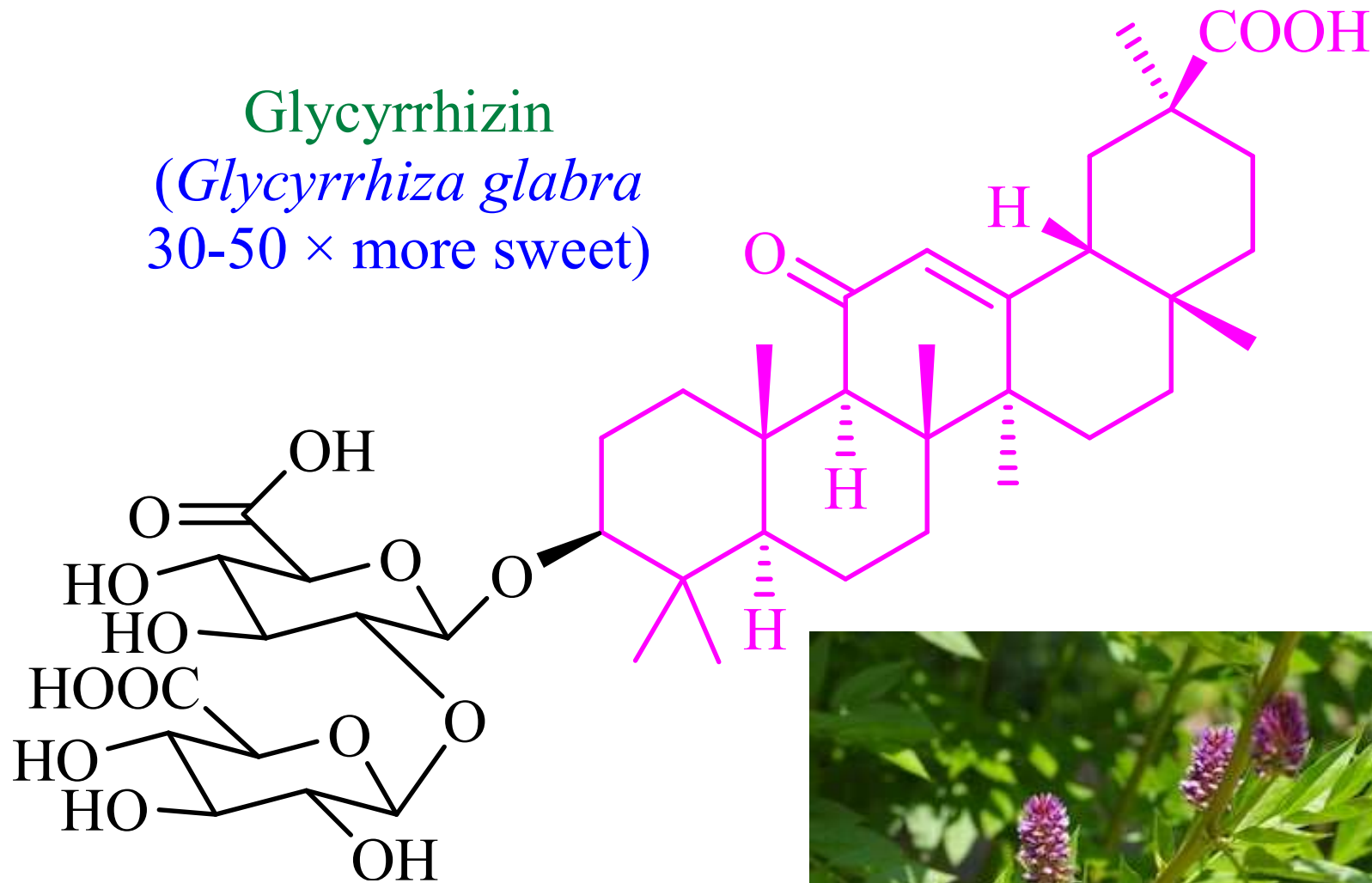


Natural Sweeteners (*Stevia*)



Natural Sweeteners (*Glycyrrhiza*)

Glycyrrhizin
(*Glycyrrhiza glabra*
30-50 × more sweet)



Sweetness

Sugar replacer	Function*	Relative sweetness (compared to sugar) ^{1,2}	Energy (kcal/g)**
Sugar (Sucrose)	Many	1	4
Acesulfame K	Low-calorie sweeteners	200	0
Aspartame		180-200	4***
Cyclamates		30-50	0
Neotame		7000-13000	0
Saccharin		300-500	0
Glycyrrhizin		30-50	0
Stevia (steviol glycosides)		200-480	0
Sucralose		600	0
Thaumatococcus		2000-3000	4***
Inulin	Bulking agents	0.1	2
Polydextrose		0	2
Lactitol	Bulk sweeteners	0.5	2.4
Maltitol		1.0	2.4
Mannitol		0.7	2.4
Sorbitol		0.5-1.0	2.4
Erythritol		0.6-0.8	0
Xylitol		1	2.4
Pectin	Gum/ Thickeners	0	2
Starch		0	4
Guar		0	2

Sources of Sweetness in Fruits

Sugars Content of Fruits and Vegetables

100 grams, edible portion

