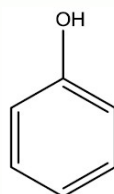


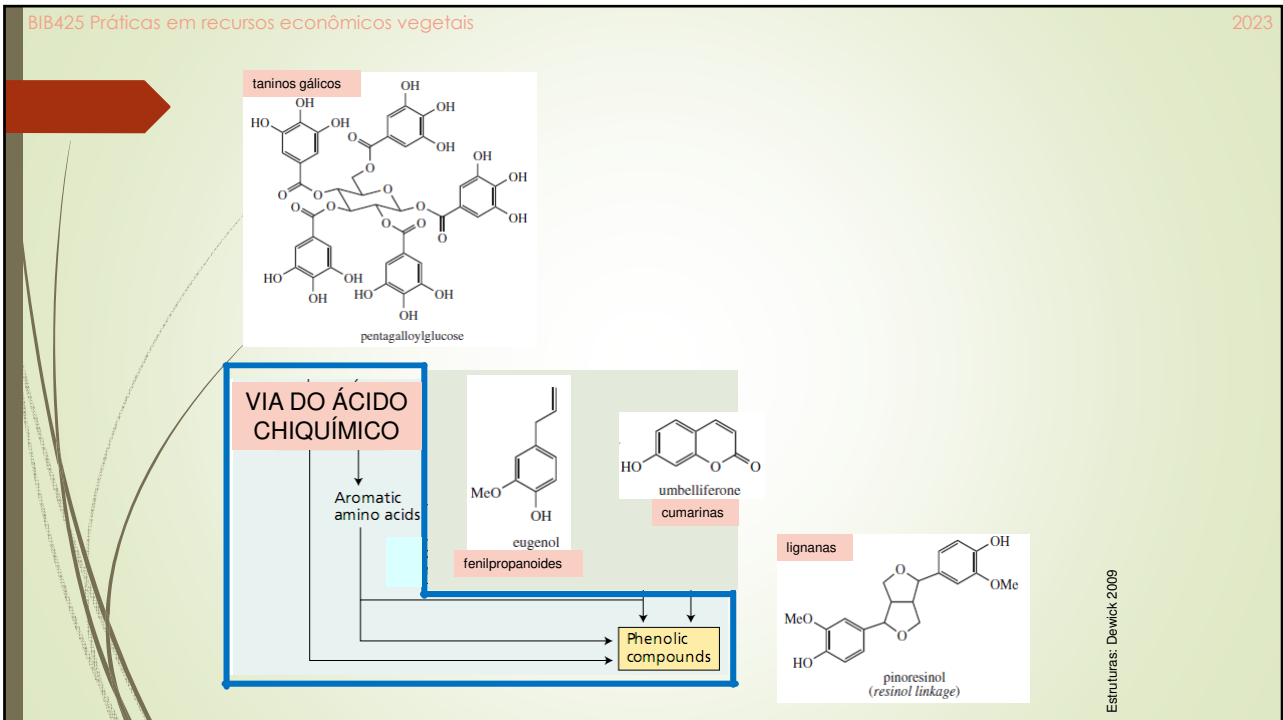
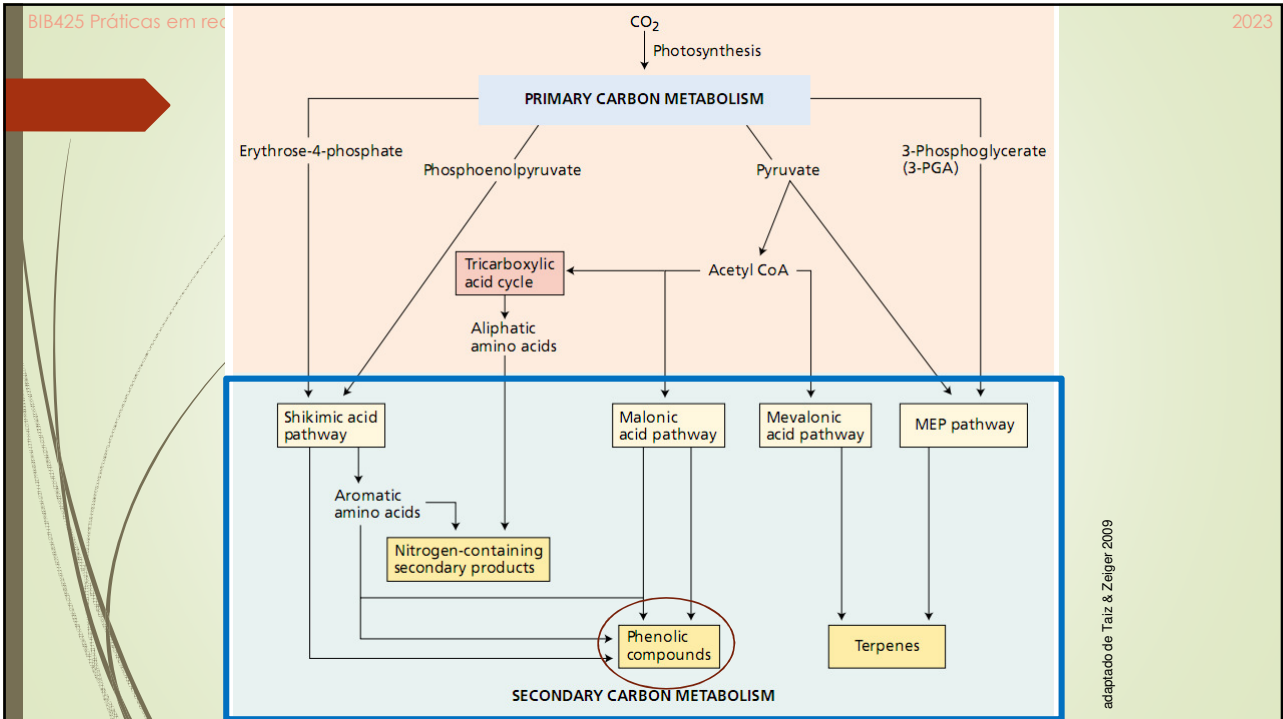
Análise de fenólicos totais, flavonoides e taninos em plantas medicinais e/ou alimentícias

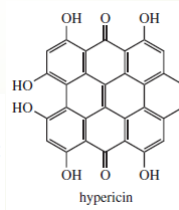
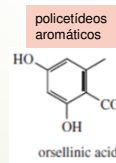
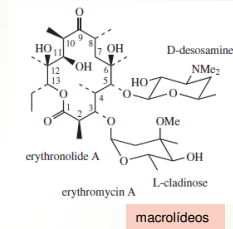
Déborah Y. A. C. Santos
dyacsan@ib.usp.br

substâncias fenólicas

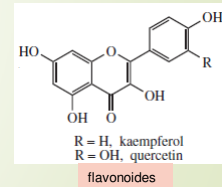
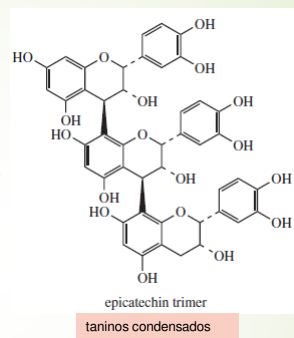
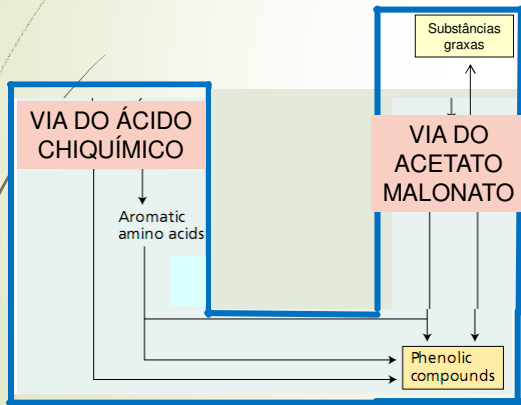


- ✓ Plantas medicinais e tóxicas
- ✓ Dieta preventiva
- ✓ Interações planta-ambiente



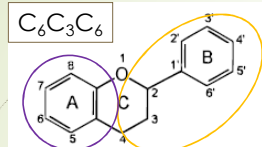


Estruturas: Dewick 2009

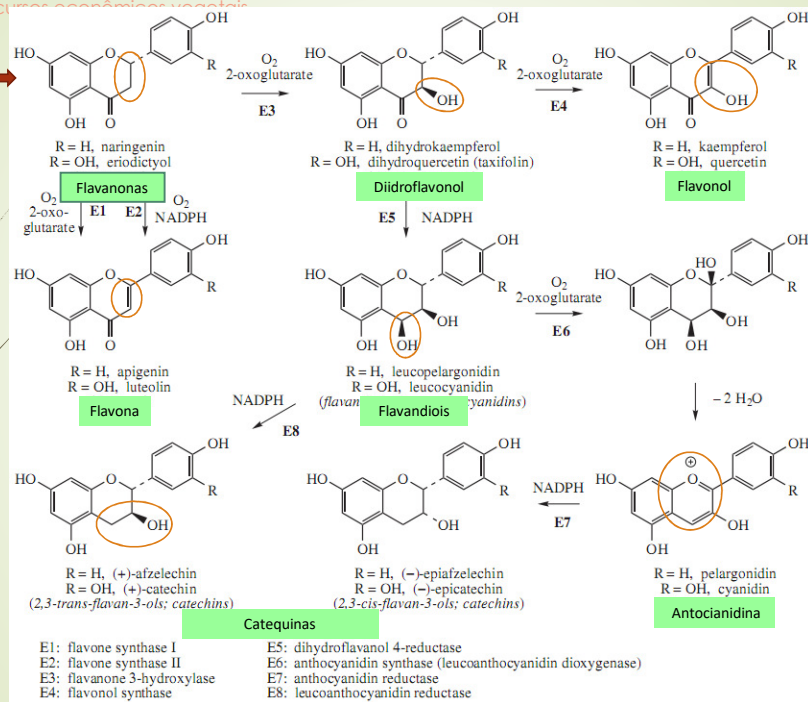
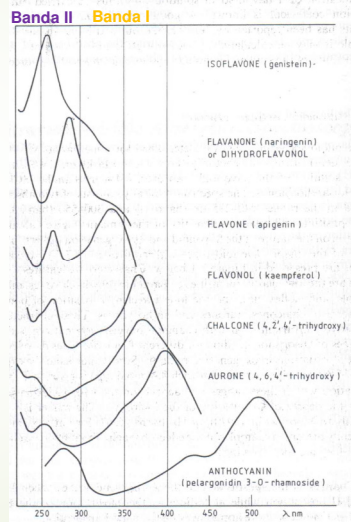
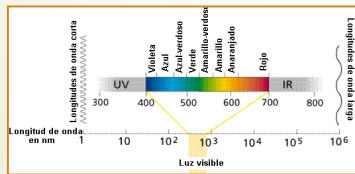
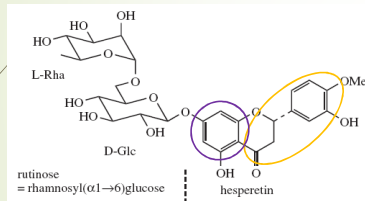


Estruturas: Dewick 2009

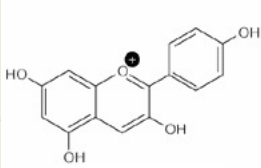

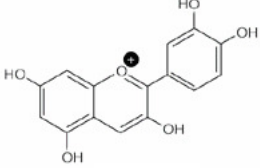

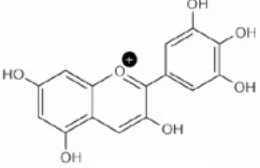

FLAVONOIDES (Vias do ácido chiquímico + acetato-malonato)

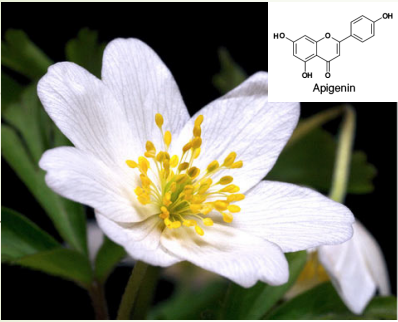
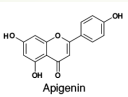




Grupos cromóforos

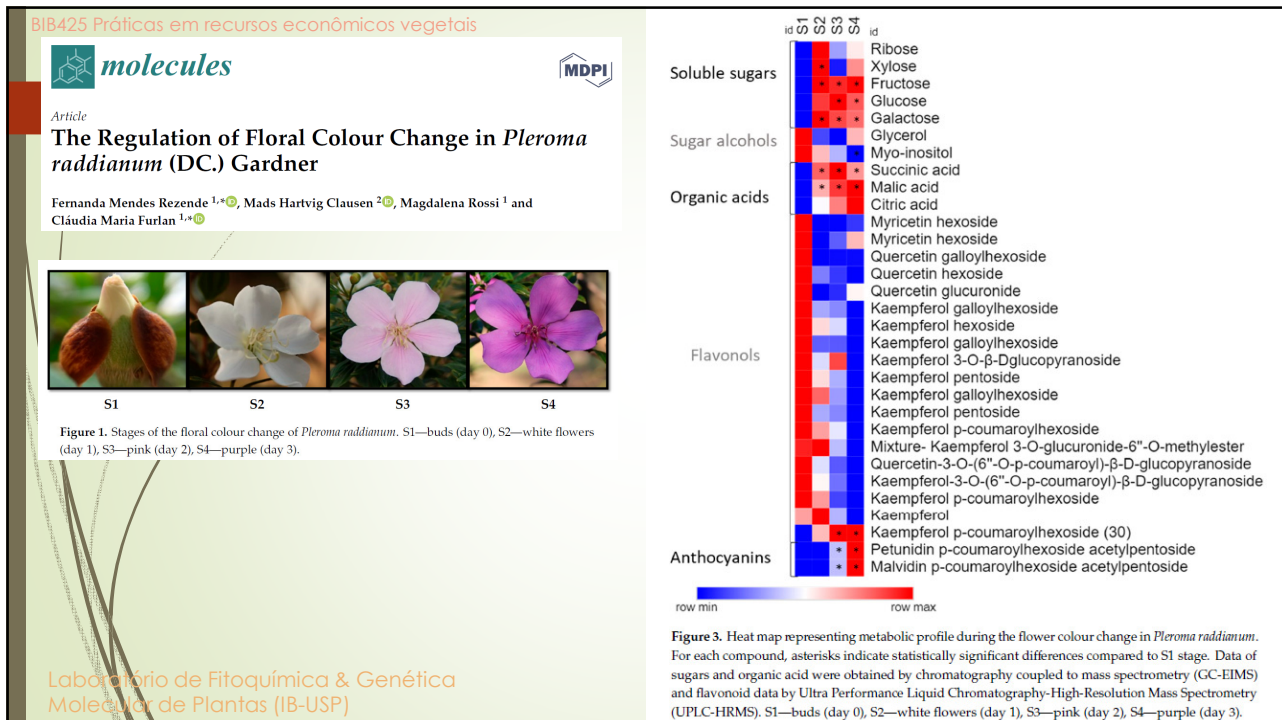


(Dewick, 2009)

 <p>pelargonidina</p>  <p><i>Pelargonium</i> (Ceranium)</p>	 <p>cianidina</p>  <p><i>Rosa</i> (Rose)</p>	 <p>delphinidina</p>  <p><i>Delphinium</i> (Larkspur)</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>visão humana</p> 	 <p>Apigenin</p>	
<p>visão abelha</p> 		

<http://www.dailymail.co.uk/science/tech/article-473887/A-bees-eye-view-How-insects-flowers-differently-us.html>

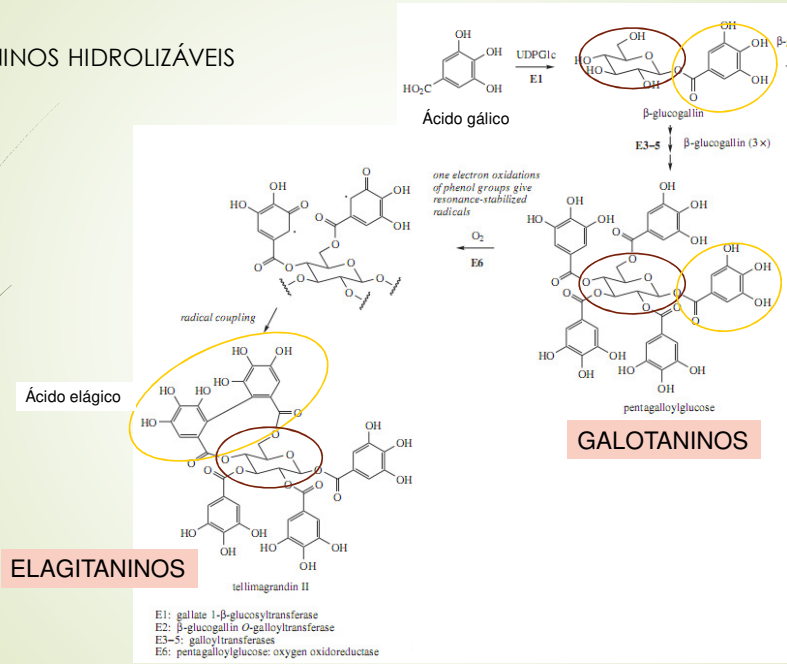


TANINOS

- ✓ Polifenóis que tem a propriedade de precipitar proteínas - ADSTRINGÊNCIA
- ✓ *tanna*: palavra alemã para casca do carvalho, usado para transformar pele animal em couro
- ✓ Atividades biológicas: anti-inflamatório, anti-oxidante, cicatrizante, anti-HIV

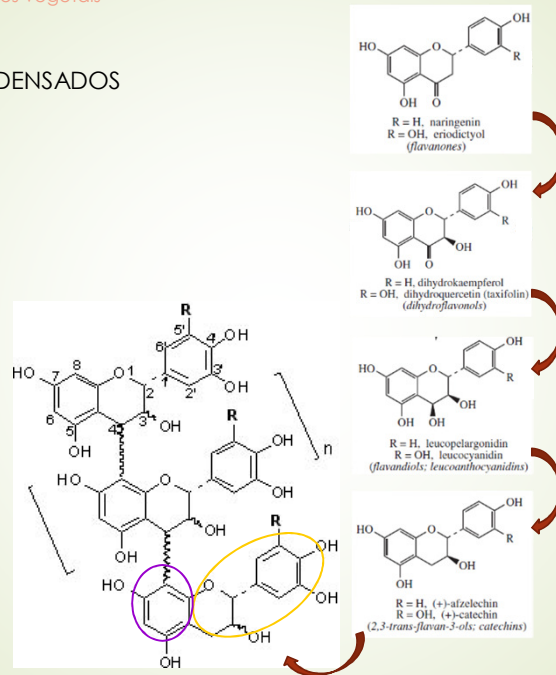


TANINOS HIDROLIZÁVEIS

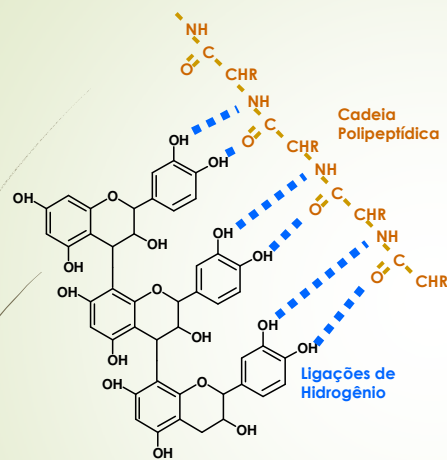


(Dewick, 2009)

TANINOS CONDENSADOS



(Dewick, 2009)



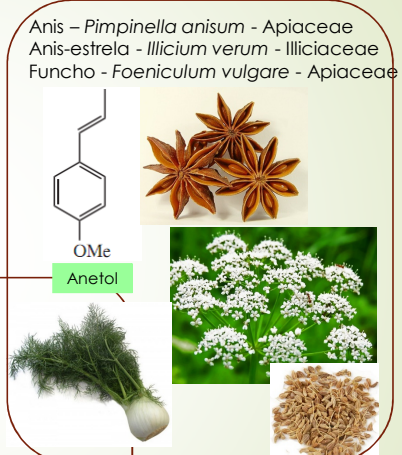
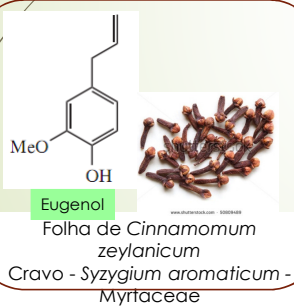
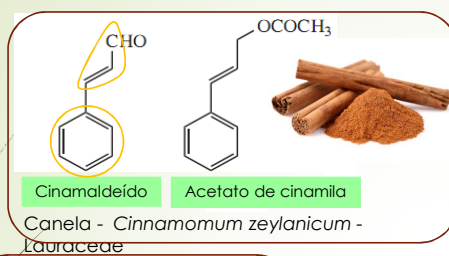
Evidências de uso na tanagem do couro:

7000 a.C. – Sul da Ásia

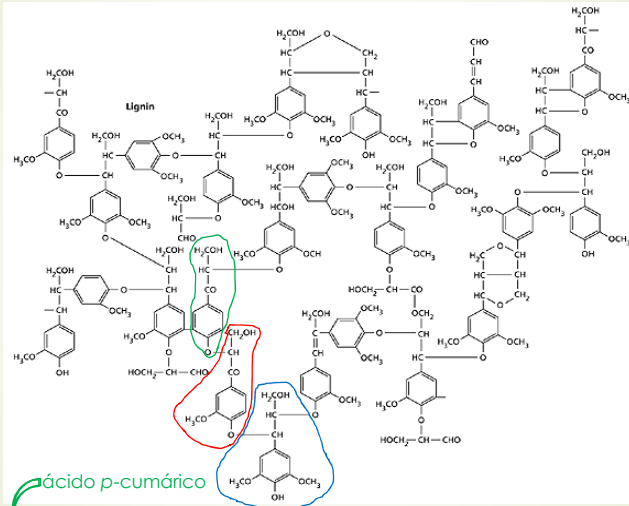
2500 a.C. – Sumérios

- ✓ Até final do Sec. XIX – o couro era totalmente produzido usando um tanante na pele do animal.
- ✓ Muitas plantas produzem taninos – principalmente arbóreas relacionado com defesa contra herbívoros papel importante na dispersão de sementes

FENILPROPANOIDES - Moléculas de **baixo peso molecular**, características de **ÓLEOS VOLÁTEIS**.



LIGNINA
 Gimnospermas - álcool **coniferílico**
 Eudicotileóneas - álcoois **coniferílico** e **sinapílico**
 Monocotiledôneas - álcoois **coniferílico**, **sinapílico** e **p-cumarílico**



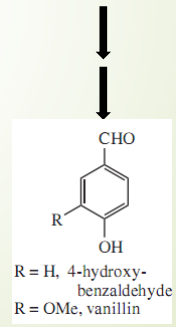
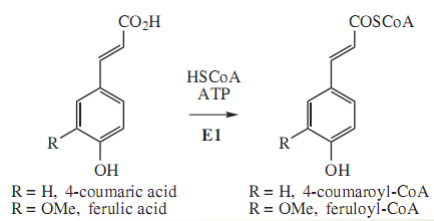
ácido sinápico


ácido p-cumárico

ácido ferúlico

Web Figure 13.3.A Partial structure of a hypothetical lignin molecule from European beech (*Fagus sylvatica*). The phenylpropanoid units that make up lignin are not linked in a simple, repeating way. The lignin of beech contains units derived from **coniferyl alcohol**, **sinapyl alcohol**, and **para-coumaryl alcohol** in the approximate ratio 100:70:7 and is typical of angiosperm lignin. Gymnosperm lignin contains relatively fewer sinapyl alcohol units. [After Nimz 1974.] *Plant Physiology*, Fourth Edition by Lincoln Taiz and Eduardo Zeiger

ÁCIDOS BENZOICOS (C6C1) DERIVADOS DE FENILPROPANOIDES (C6C3)



 Importância dos fenólicos

- ✓ Papel ecológico – polinizadores (odor, cor); herbivoria
- ✓ Atividades biológicas - anti-inflamatório, anti-oxidante, cicatrizante, anti-HIV, anti-cancer, protetor contra problemas cardiovasculares
- ✓ Alimentação – aa essenciais, alimentos funcionais (nutracêuticos)