# Chemical Constituents from the Seeds of *Cerbera manghas* and the Stems of *Derris trifoliata*

Sarot Cheenpracha

Master of Science Thesis in Organic Chemistry

Prince of Songkla University

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| ชื่อวิทยานิพนธ์ | องค์ประกอบทางเคมีของเมล็ดตีนเป็ดทรายและเถาถอบแถบ |
| ผู้เขียน | นายสาโรจน์ จีนประชา |
| สาขาวิชา | เคมีอินทรีย์ |
| ปีการศึกษา | 2546 |

## บทคัดย่อ

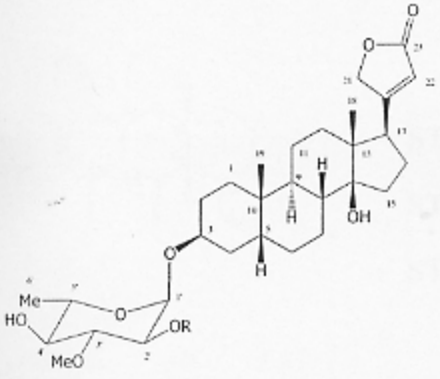

*ตอน 1 องค์ประกอบทางเคมีจากเมล็ดตีนเป็ดทราย (Cerbera manghas)*

การศึกษาส่วนสกัดหยาบเมทิลีน คลอไรด์ของเมล็ดสดของต้นตีนเป็ดทราย สามารถแยกสารประกอบคาร์ดิโนไลด์ไกลโคไซด์ใหม่ 1 สาร คือ 7,8-dehydrocerberin (**SM6**) และเป็นสารที่มีการรายงานแล้ว 5 สาร คือ 17$\beta$-neriifolin (**SM1**), deacetyltanghinin (**SM2**), tanghinin (**SM3**), 2′-*O*-acetyl-cerleaside A (**SM4**) และ cerberin (**SM5**)

*ตอน 2 องค์ประกอบทางเคมีจากเถาถอบแถบ ( Derris trifoliata)*

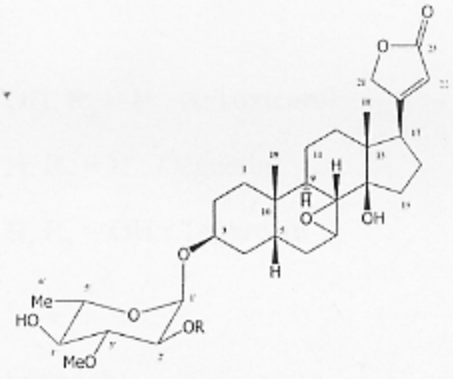
ส่วนสกัดหยาบเฮกเซน และ เมทิลีนคลอไรด์ของเถาถอบแถบ สามารถแยกสารใหม่ได้ 3 สาร คือ trifolinone A (**STH4**), 6,7-dimethoxy-2,3-dihydro-4*H*-chromen-4-one (**STH10**) และ trifolinone B (**STH11**) นอกจากนั้นยังพบสารที่มีการรายงานแล้ว 19 สาร คือ lupinifolin (**STH1**), dereticulatin (**STH2**), $\alpha$-toxicarol (**STH3**), deguelin (**STH5**), rotenone (**STH6**), 12a-hydroxyrotenone (**STH7**), 12a-hydroxyelliptone (**STH8**), tephrosin (**STH9**), 1′′′-hydroxy-2′′′,3′′′-epoxylupinifolin (**STH12**), lupeol (**STH13**), 6a,12a-dehydro-$\alpha$-toxicarol (**STC1**), senegalensien (**STC2**), medicarpin (**STC3**), 6a,12a-dehydrorotenone (**STC4**), prunetin (**STC5**), lupinifolinol (**STC6**), 6a,12a-dehydrodeguelin (**STC7**), 4-methoxy-1-benzofuran-5-carboxylic acid (**STC8**) และ7,4′-dihydroxy-3′-methoxy-isoflavone (**STC9**) และสารผสมของ$\beta$-sitosterol (**STH14**) และ stigmasterol (**STH15**)

โครงสร้างของสารประกอบเหล่านี้วิเคราะห์โดยใช้ข้อมูลทาง สเปกโทรสโกปี สำหรับสารประกอบ **SM2** และ **STH12** ยืนยันโครงสร้างด้วยข้อมูลทางเอกซ์เรย์



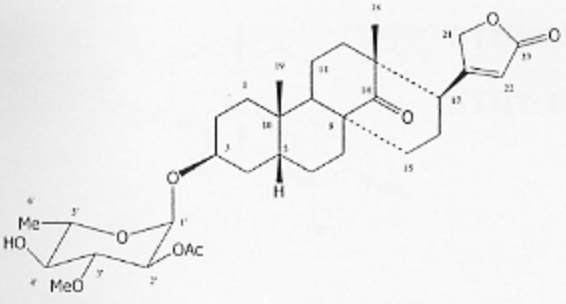

**SM1:** R= H: 17$\beta$-Neriifolin

**SM5:** R= Ac: Cerberin

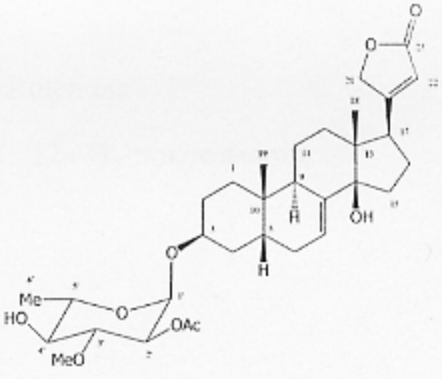



**SM2:** R= H: Deacetyltanghinin

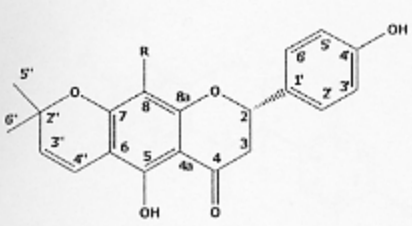
**SM3:** R= Ac: Tanghinin




**SM4:** 2′-*O*-Acetyl-cerleaside A



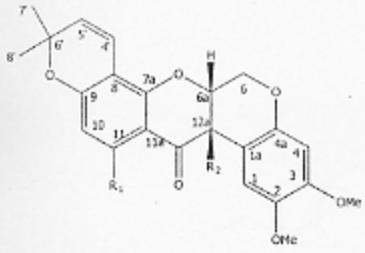

**SM6:** 7,8-Dehydrocerberin



**STH1:** R = isoprenyl : Lupinifolin

**STH2:** R =  : Dereticulatin

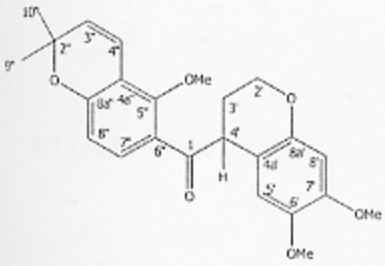
**STH12:** R =  :1‴-Hydroxy-2‴,3‴-



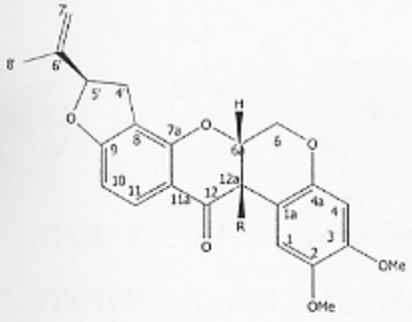
**STH3:** $R_1$ = OH, $R_2$ = H : α-Toxicarol

**STH5:** $R_1$ = H, $R_2$ = H : Deguelin

**STH9:** $R_1$ = H, $R_2$ = OH : Tephrosin

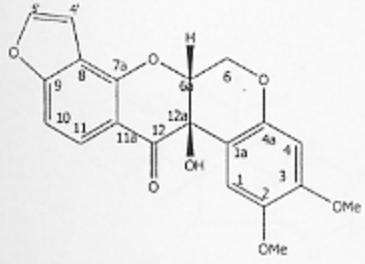


**STH4:** Trifolinone A

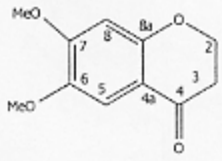


**STH6:** R = H : Rotenone

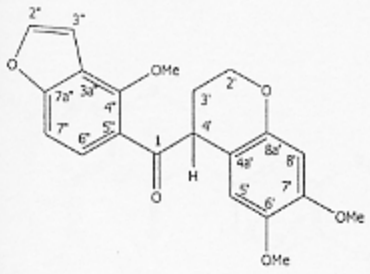
**STH7:** R = OH : 12a-Hydroxyrotenone



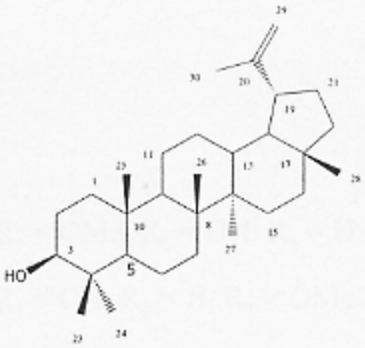
**STH8:** 12a-Hydroxyelliptone



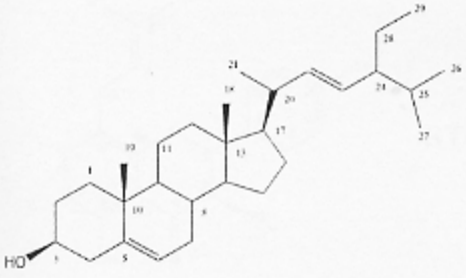
**STH10:** 6,7-Dimethoxy-2,3-dihydro-4*H*-chromen-4-one



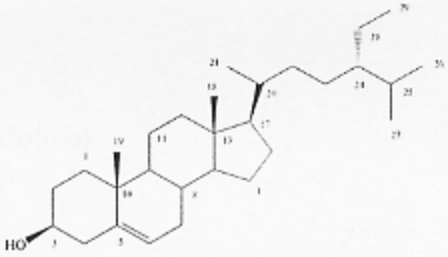
**STH11:** Trifolinone B



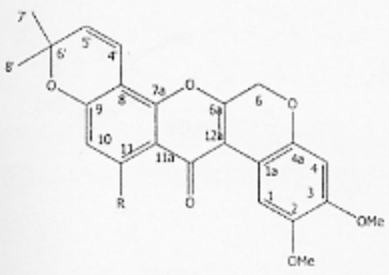
**STH13:** Lupeol



**STH14:** Stigmasterol

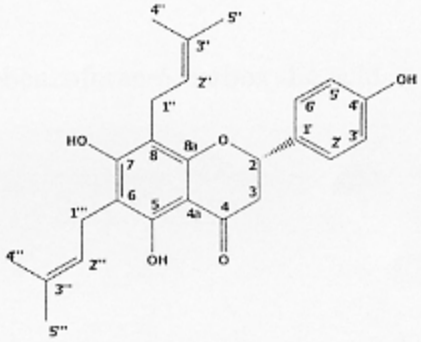


**STH15:** $\beta$-Sitosterol

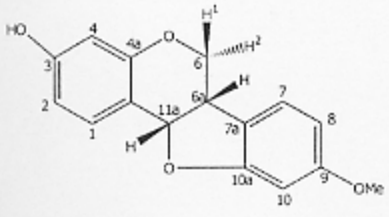


**STC1:** R = OH : 6a,12a-Dehydro-α-toxicarol

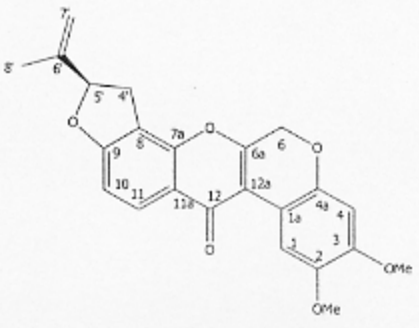
**STC7:** R = H : 6a,12a-Dehydrodeguelin



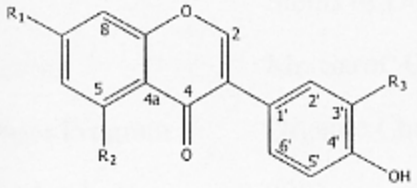
**STC2:** Senegalensein



**STC3:** Medicarpin



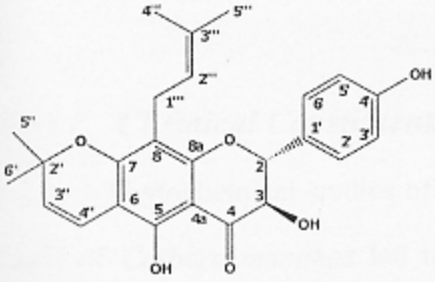
**STC4:** 6a,12a-Dehydrorotenone



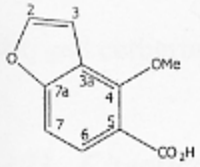

**STC5:** $R_1$ = OMe, $R_2$ = OH, $R_3$ = H : Prunetin

**STC9:** $R_1$ = OH, $R_2$ = H, $R_3$ = OMe :

7,4′-Dihydroxy-3′-methoxyisoflavone




**STC6:** Lupinifolinol




**STC8:** 4-Methoxy-1-benzofuran-5-carboxylic acid

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| Author | Mr. Sarot Cheenpracha |
| Major Program | Organic Chemistry |
| Academic Year | 2003 |

## ABSTRACT


### *Part I Chemical Constituents from the Seeds of Cerbera manghas*

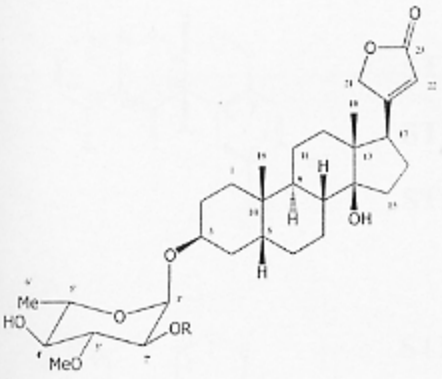
Phytochemical studies of the crude methylene chloride extract from the fresh seeds of *Cerbera manghas* led to isolation of one new cardenolide glycoside, 7,8-dehydrocerberin (**SM6**), together with four known cardenolide glycosides, 17$\beta$-neriifolin (**SM1**), deacetyltanghinin (**SM2**), tanghinin (**SM3**), 2′-*O*-acetyl-cerleaside A (**SM4**) and cerberin (**SM5**).

### *Part II Chemical Constituents from the Stems of Derris trifoliata*

The hexane and methylene chloride extracts of the stems of *Derris trifoliata* yielded three new compounds, trifolinone A (**STH4**), 6,7-dimethoxy-2,3-dihydro-4*H*-chromen-4-one (**STH10**) and trifolinone B (**STH11**), together with nineteen known compounds, lupinifolin (**STH1**), dereticulatin (**STH2**), $\alpha$-toxicarol (**STH3**), deguelin (**STH5**), rotenone (**STH6**), 12a-hydroxyrotenone (**STH7**), 12a-hydroxyelliptone (**STH8**), tephrosin (**STH9**), 1‴-hydroxy-2‴,3‴-epoxylupinifolin (**STH12**), lupeol (**STH13**), 6a,12a-dehydro-$\alpha$-toxicarol (**STC1**), senegalensien (**STC2**), medicarpin (**STC3**), 6a,12a-dehydrorotenone (**STC4**), prunetin (**STC5**), lupinifolinol (**STC6**), 6a,12a-dehydrodeguelin (**STC7**), 4-methoxy-1-benzofuran-5-carboxylic acid (**STC8**)

and 7,4′-dihydroxy-3′-methoxyisoflavone (**STC9**) and a mixture of $\beta$-sitosterol (**STH14**) and stigmasterol (**STH15**).

Their structures were elucidated by spectroscopic methods. In addition, the structures of **SM2** and **STH12** were confirmed by X-ray diffraction.




**SM1:** R= H: 17$\beta$-Neriifolin

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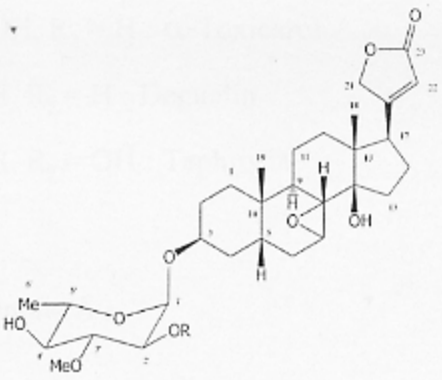
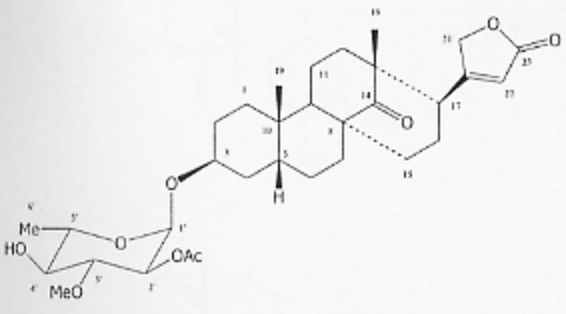
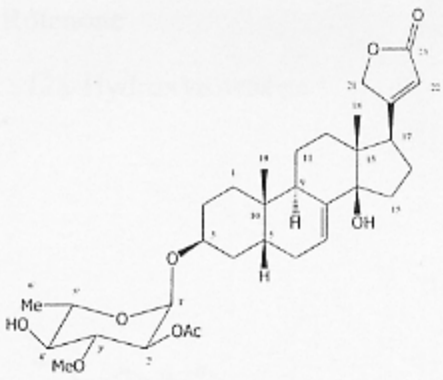



**SM2:** R= H: Deacetyltanghinin

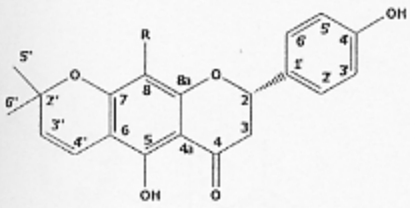
**SM3:** R= Ac: Tanghinin




**SM4:** 2′-*O*-Acetyl-cerleaside A



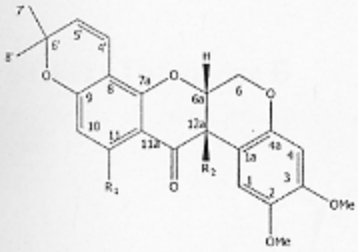

**SM6:** 7,8-Dehydrocerberin



**STH1:** R = isoprenyl : Lupinifolin

**STH2:** R =  : Dereticulatin

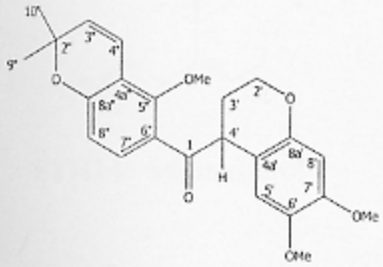
**STH12:** R =  :1‴-Hydroxy-2‴,3‴-



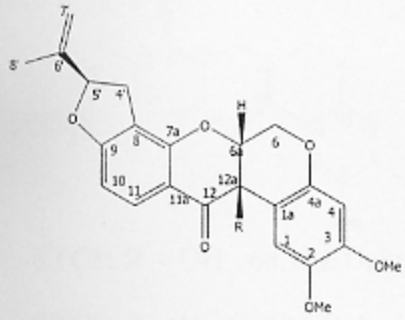
**STH3:** $R_1$ = OH, $R_2$ = H : α-Toxicarol

**STH5:** $R_1$ = H, $R_2$ = H : Deguelin

**STH9:** $R_1$ = H, $R_2$ = OH : Tephrosin

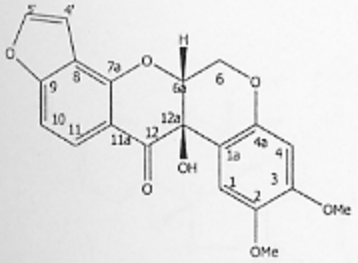


**STH4:** Trifolinone A

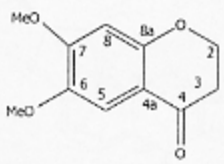


**STH6:** R = H : Rotenone

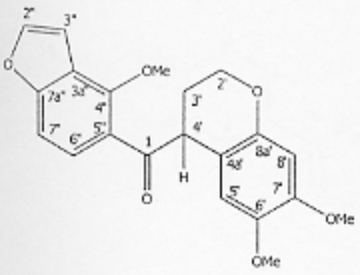
**STH7:** R = OH : 12a-Hydroxyrotenone



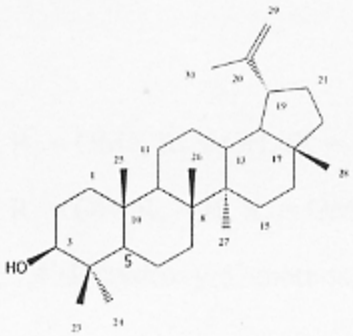
**STH8:** 12a-Hydroxyelliptone



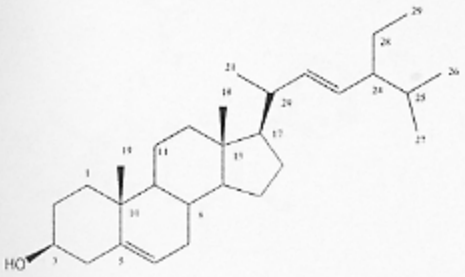
**STH10:** 6,7-Dimethoxy-2,3-dihydro-4*H*-chromen-4-one



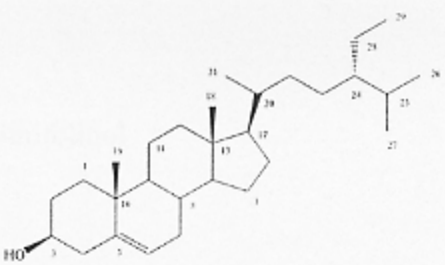
**STH11:** Trifolinone B



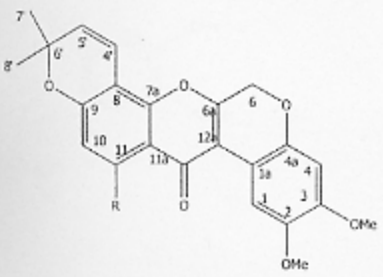
**STH13:** Lupeol



**STH14:** Stigmasterol

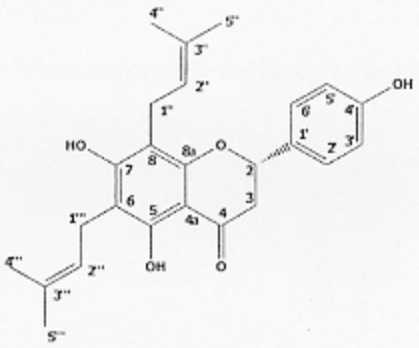


**STH15:** $\beta$-Sitosterol

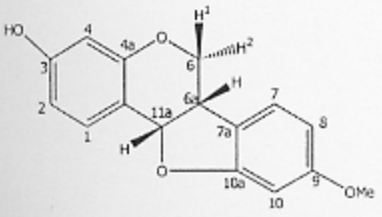


**STC1:** R = OH : 6a,12a-Dehydro-α-Toxicarol

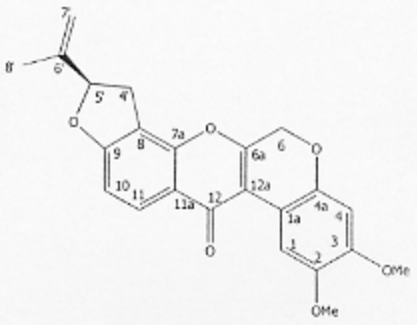
**STC7:** R = H : 6a,12a-Dehydrodeguelin



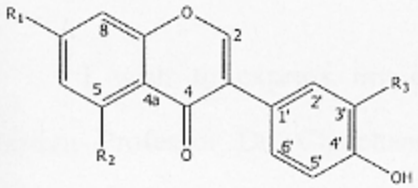
**STC2:** Senegalensein



**STC3:** Medicarpin



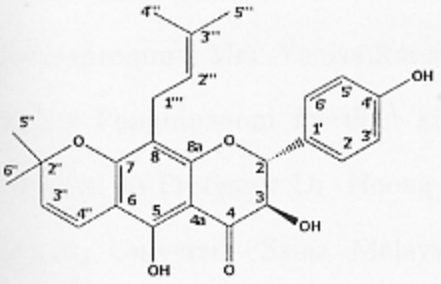
**STC4:** 6a,12a-Dehydrorotenone



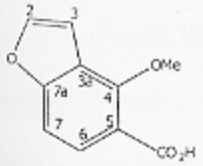
**STC5:** $R_1$ = OMe, $R_2$ = OH, $R_3$ = H : Prunetin

**STC9:** $R_1$ = OH, $R_2$ = H, $R_3$ = OMe :

7,4′-Dihydroxy-3′-methoxyisoflavone



**STC6:** Lupinifolinol



**STC8:** 4-Methoxy-1-benzofuran-5-carboxylic acid