CONSTITUENTS OF PLANTS GROWING IN QATAR XXV
FLAVONOIDS OF PICRIS RADICATA (Forssk.) Less.

By

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Four flavonoids were isolated from the plant and were identified as apigenin, chrysin 7-glucoside, luteolin, and luteolin 7-glucoside.

Key Words: Picris radicata, Compositae, Lactuceae, Flavonoids, Apigenin, Chrysin 7-glucoside, Luteolin, Luteolin 7-glucoside.

ABSTRACT

Four flavonoids were isolated from the plant and were identified as apigenin, chrysin 7-glucoside, leuteoline and luteolin 7-glucoside.

INTRODUCTION

Sesquiterpene lactones have been isolated from several Picris species viz P. aculeata, P. altissima, P. cyanocarpa, P. echiolides, P. hieracioides, P. hieraciodes var. japonica, P. hieraciode subsp. hieracioides P. hieraciodes subsp. japonica and P. spinifera[1-12], triterpenes were isolated from two species (P. felterrae Liour and P. hieraciodes)[13,14] and sterols were identified from P. hieraciodes[15]. The present work deals with the study of the flavanoid constituents of Picris radicata growing in Qatar.

EXPERIMENTAL

Plant material: Picris radicata (Forssk.) Less. (Compositae, tribe Lactuceae) was collected from Dukhan (south of Qatar) in April. The whole plant was air dried and grinded to fine powder.

Apparatus and techniques: The UV and MS data were recorded on a Pye Unicam spectrophotometer model SP8-100 and Schimatzu Mass spectrometer respectively. Column chromatography was carried out using Sephadex LH-20 and applying 96% ethanol as an eluent. Thin layer chromatography was carried out using polyamide developed with butanol-acetic acid-water (6:2:1).

Extraction and fractionation: The whole plant was extracted with MeOH in a Soxhlet for 24 hours, then the extract was dried under vacuum. The resulted extract was partitioned between water-chloroform (1:1). The aqueous layer was then extracted exhaustively with ethyl acetate yielding crude flavonoid extract (0.4664g). This was subjected to column chromatography (Sephadex LH-20) using 96% EtOH as eluent. Fractions were further separated into single components using preparative TLC technique. Comparative studies on the purified fractions with authentic samples were made on TLC and identification was confirmed by comparing their UV and MS spectral data with that reported in literature[16-18].

Apigenin: Fractions 11-17 (Sephadex column) were purified on a preparative polyamide TLC and crystallized from methanol (mp. 344-346 °C, Table 1). Identification was confirmed by UV comparison with authentic sample (Table 2) and MS (m/e: 270, C15H10O5, fragment ions at 242, 153, 124, 121 and 118).

Chrysin 7-O-glucoside: Fractions 11-18 (Sephadex column) gave after purification on a preparative polyamide TLC (Table 1) a single component which was identified as chrysin 7-O-glucoside (TLC, UV).
Luteolin:
Fractions (12-16 Sephadex column) were purified on a preparative polyamide TLC and crystallized from methanol yielding yellow crystals m.p. 327-329 °C (Table 1). Its identification as luteolin was confirmed by comparison with authentic sample material UV (Table 2), MS (m/e: 286, C_{15}H_{10}O_{6} and fragment ions at 258, 153, 134 and 124.

Luteolin 7-O-glucoside:
Fractions 11-20 (Sephadex column) gave after purification on a preparative polyamide TLC (Table 1) a single component which was identified as luteolin 7-O-glucoside (TLC, UV).

Table 1
TLC data of the isolated compounds

<table>
<thead>
<tr>
<th>Flavonoid</th>
<th>Rf*</th>
<th>UV (Colour)</th>
<th>UV/NH3 (Colour)</th>
<th>Na** (Colour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apigenin</td>
<td>0.53</td>
<td>Deep purple</td>
<td>Yellow-green</td>
<td>Brown</td>
</tr>
<tr>
<td>Chrysin 7-O-glucoside</td>
<td>0.38</td>
<td>Deep purple</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Luteolin</td>
<td>0.13</td>
<td>Deep purple</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Luteolin 7-O-glucoside</td>
<td>0.26</td>
<td>Deep purple</td>
<td>Yellow</td>
<td>Pink</td>
</tr>
</tbody>
</table>

* Polyamide, butanol-acetic acid-water (6:2:1).
** Na: Natural Product Reagent

Table 2
Ultraviolet spectral data of the isolated flavonoids

<table>
<thead>
<tr>
<th>Flavonoid</th>
<th>MeOH</th>
<th>NaOMe</th>
<th>AlCl3</th>
<th>AlCl3 + HCl</th>
<th>NaOAc</th>
<th>NaOAc + H_{3}BO_{3}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apigenin</td>
<td>265, 295 sh,</td>
<td>275, 325,</td>
<td>275, 300, 349,</td>
<td>275, 300, 340,</td>
<td>275, 300,</td>
<td>275, 301 sh,</td>
</tr>
<tr>
<td></td>
<td>337</td>
<td>391</td>
<td>385</td>
<td>380</td>
<td>375</td>
<td>337</td>
</tr>
<tr>
<td>Chrysin 7-O-glucoside</td>
<td>235, 268,</td>
<td>237, 263 sh,</td>
<td>235, 275, 295 sh,</td>
<td>231, 275, 295 sh,</td>
<td>236, 270,</td>
<td>236, 267,</td>
</tr>
<tr>
<td></td>
<td>280 sh, 343</td>
<td>267, 390,</td>
<td>340, 414</td>
<td>347, 385</td>
<td>385</td>
<td>282 sh, 360</td>
</tr>
<tr>
<td>Luteolin</td>
<td>240, 250, 265,</td>
<td>265, 328 sh,</td>
<td>274, 300 sh, 327,</td>
<td>264 sh, 273,</td>
<td>269, 325 sh,</td>
<td>260, 300 sh,</td>
</tr>
<tr>
<td></td>
<td>287, 345</td>
<td>400</td>
<td>352</td>
<td>293 sh, 353, 381</td>
<td>385</td>
<td>368, 430</td>
</tr>
<tr>
<td>Luteolin 7-O-glucoside</td>
<td>255, 265 sh,</td>
<td>260, 300 sh,</td>
<td>275, 300 sh, 430</td>
<td>271 sh, 295 sh,</td>
<td>260, 265 sh,</td>
<td>260, 371</td>
</tr>
<tr>
<td></td>
<td>346</td>
<td>395</td>
<td></td>
<td></td>
<td>360, 389</td>
<td>405</td>
</tr>
</tbody>
</table>

REFERENCES
Flavonoids of Picris radicata


