

Phytochemical profiles and potential health benefits of *Helicteres hirsuta* Lour.

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Abstract: *Helicteres hirsuta* Lour. (*H. hirsuta*) has been used traditionally as a folk medicine for treating a range of common diseases such as furuncle treatment, pain relief, dysentery, measles, flu, anti-malaria and anti-obesity in some Asian countries, revealing that this plant material contains important bioactive compounds, which are linked with health benefits and/or can act as therapeutic agents. Hence, many attempts have been made to isolate and identify the key bioactive compounds present in *H. hirsuta* and conduct *in vitro* tests to investigate their biological activities. We recently revealed that *H. hirsuta* leaf contained high levels of total phenolic content [192.6 mg gallic acid equivalents (GAE)/g] and total flavonoid content [215.2 mg catechin equivalents (CE)/g]. The stem of *H. hirsuta* also had high contents of TPC and TFC (212.6 mg GAE/g and 280.1 mg CE/g, respectively). The results also revealed that phenolic compounds from this plant had a strong positive correlation with antioxidant capacity including DPPH, ABTS radical scavenging activity and ferric reducing antioxidant power (R^2 range of 0.78 and 0.99), which are known to link with diverse bioactivities including antioxidant, antimicrobial, anticancer, antiobesity and antidiabetic effects. Additionally, *H. hirsuta* leaf and stem were found to contain high levels of saponins (808.0 and 347.5 mg escin equivalents/g, respectively), that were determined using colorimetric assay. Several individual compounds have been identified in the extracts of *H. hirsuta*, including rutin, methyl caffeate, 5,8-dihydroxy-7,4'-dimethoxyflavone, isoscutellarein 4'-methyl ether 8-O- β -D-glucopyranoside, 4,4'-sulfinylbis(2(*tert*-butyl)-5-methylphenol), 7-O-methylisoscutellarein, 7,4'-di-O-methylisoscutellarein, six lignans (pinoresinol, medioresinol, syringaresinol, boehmenan, boehmenan H, and trans-dihydrodiconiferyl alcohol), betulinic acid, 3-O-*trans*-caffeoylbetulinic acid, 3 β -benzoylbetulinic acid, betulinic acid methyl ester, lupeol, 3 β -O-acetylbetulinic acid, simiarenol, stigmasterol and β -sitosterol. The derived extracts and isolated compounds from this plant have been shown to inhibit the growth of various cancer cell lines *in vitro* as well as offering a promising source of active compounds for other health problems including obesity, diabetes and malaria. Further studies on the mechanisms of bioactive compounds from this plant are suggested to elucidate their mechanisms of action for health benefits. In addition, more *in vivo* tests associated with clinical trials are also needed to validate and confirm their effects for further development of nutraceutical and pharmaceutical products from this plant material.

Key words: *Helicteres hirsuta* Lour.; bioactive compounds; health benefits