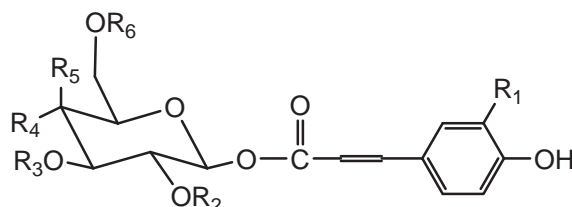
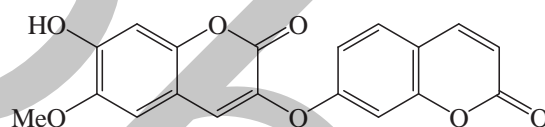


Seven hydroxycinnamate derivatives were isolated from the plant *viz.* 1-caFFEylglucose and sulphate esters of 1-coumarylglucose, 1-coumarylgalactose (Imperato, 1982b), 1-*p*-coumarylglucose 6-sulphate (**37**), 1-*p*-coumarylglucose 2-sulphate (**38**), 1-caFFEylglucose 3-sulphate (**39**) and 1-caFFEylgalactose 6-sulphate (**40**) (Imperato, 1982d). Daphnoretin (**41**) was isolated from the fronds of the plant growing in Egypt (El-Tantawy *et al.*, 1994).



- | | |
|--|---|
| 37 1- <i>p</i> -Coumarylglucose 6-sulphate | $R_1=R_2=R_3=R_5=H, R_4=OH, R_6=SO_3^-$ |
| 38 1- <i>p</i> -Coumarylglucose 2-sulphate | $R_1=R_3=R_5=R_6=H, R_4=OH, R_2=SO_3^-$ |
| 39 1- <i>p</i> -Caffeylglucose 3-sulphate | $R_2=R_5=R_6=H, R_1=R_4=OH, R_3=SO_3^-$ |
| 40 1- <i>p</i> -Caffeylgalactose 6-sulphate | $R_2=R_3=R_4=H, R_1=R_5=OH, R_6=SO_3^-$ |



41 Daphnoretin

Two alicyclic acids *viz.* quinic acid and shikimic acid were identified in *Adiantum capillus-veneris* (Minamikawa and Yoshida, 1972). The fronds contain tannins (5.5%) yielding by thermofractography resorcinol, phloroglucinol, methylphloroglucinol, and pyrocatechol (El-Tantawy *et al.*, 1994).

Folk Medicine, Pharmacological and Biological Activities

In the Punjab, the leaves along with pepper, are administered as a febrifuge, and in South India, when prepared with honey, they are used in catarrhal affections. At Colomas (Mexico), the plant is used as a tea to relieve colic and for amenorrhea. In France, large quantities are employed in the preparation of "Sirop de Capillaire". It may be used in all coughs, throat affections, and bronchial disorders (Kirtikar and Basu, 1984). A Chinese medicinal composition is manufactured from (by weight parts) *Adiantum capillus-veneris* 80-120, *Gryllotalpa africana* 4-8, *Vaccaria segetalis* 8-12, *Gleditsia sinensis* 45-55, and hedgehog hide 8-12. The traditional Chinese medicinal composition is used to prepare drug tablet, capsule, granule and soft capsule for treating prostatitis and hyperplasia of prostate (Zhu, 2007). Also, a Chinese medicinal preparation for the treatment of diabetes is prepared from *Adiantum capillus-veneris* (Zheng, 2009). The plant is among the medicinal herbs that are used for helminthiasis (Ramasubramanijara and Niranjan, 2010).

Both the petroleum ether extract of the whole plant and the terpenoid compound, isoadiantone, were active as inhibitors of postcoital implantation in rats (Murthy *et al.*, 1984). The plant extract exhibited antiviral activity (Husson *et al.*, 1986). The water extract of *Adiantum capillus-veneris* had *in vitro* and *in vivo* antimicrobial efficacy and diuretic efficacy, which provided strong pharmacologic proofs for its further treatment of urinary tract infections (Yuan *et al.*, 2010). *Adiantum capillus-veneris* extracts or the isolated compounds exhibited antiviral (Husson *et al.*, 1986), antimicrobial (Singh *et al.*, 2008; Yuan *et al.*, 2010), diuretic (Yuan *et al.*, 2010), hypoglycemic (El-Tantawy *et al.*, 1994; Neef *et al.*,

1995; Ibraheim *et al.*, 2011), antioxidant (Singh *et al.*, 2008; Rajurkar and Gaikwad, 2012) analgesic (Haider *et al.*, 2011) and anti-inflammatory activities (Haider *et al.*, 2011; Ibraheim *et al.*, 2011). Alwan *et al.* (1989) reported that the alcoholic extract of the plant did not inhibit the binding of 3H-benzo[a]pyrene to rat liver microsomal protein.

3.2. ANOGRAMMA Link

The genus *Anogramma* is represented in Egypt by one species.

3.2.1. *Anogramma leptophylla* (L.) Link, Fil. Sp. Berol. Cult. 1: 137 (1841); Boulos, Fl. Egypt 1: 3 (1999).

Syns. *Polypodium leptophyllum* L., Sp. Pl., ed. 1, 1092 (1753).

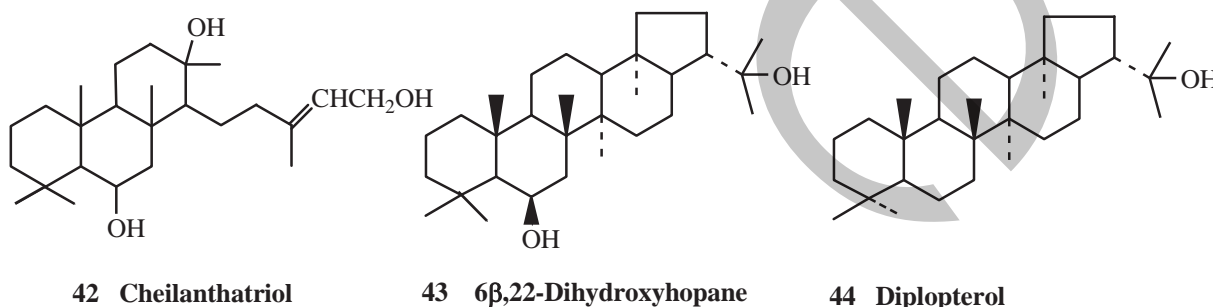
Gymnogramma leptophylla (L.) Desv., Berl. Mag. 5: 305 (1811).

Nothing has been reported about the constituents and/or biological activities of this species.

3.3. CHEILANTHES Sw., nom. Conserv.

Chemical Constituents

The major components of the white exudates of farina from the abaxial side of the fronds of *Cheilanthes argentea* are the diterpenoid acids *ent*-8(17),*E*-13-labadien-1 oic acid and its 3*R*-hydroxy derivative (Wollenweber *et al.*, 1982). A kaurane diterpene identified as *ent*-kaura-16-en-19-oic acid was isolated from the viscid exudates found on fronds of the fern *Cheilanthes kaulfussi* (Wollenweber *et al.*, 1989). Two sesterterpenes *viz.* cheilanthatriol (**42**) (Khan *et al.*, 1971) and cheilarinosin (Iyer *et al.*, 1972) were obtained from *Cheilanthes farinosa*. Fern-9(11)-en-3-one was isolated from *Cheilanthes longissima* (Sunder *et al.*, 1976). Three triterpenes *viz.* 6 β ,22-dihydroxyhopane (**43**), fernenol and diplopterol (**44**) in addition to β -sitosterol-*O*- β -D-glucoside were isolated from *Cheilanthes marantae* (Gonzalez *et al.*, 1976).



A styrene glycoside (hydroxysteryl- β -D-glucoside) was extracted from *Cheilanthes kuhnii* (Murakami *et al.*, 1980). β -Sitosterol and β -sitosterol glucoside were isolated from *Cheilanthes longissima* (Sunder *et al.*, 1974).

Farinosyn, an insect growth regulator was isolated from the silver fern *Cheilanthes farinosa* (Sivakumar *et al.*, 2003). Two ecdysone analogs, cheilanthone A (7,8-dihydroecdysone) and cheilanthone B (25-deoxy-7,8-dihydroecdysone) were identified from *Cheilanthes tenuifolia* (Faux *et al.*, 1970). Cheilanthone B was also identified from