

Oral administration of the lignan justicidin A, isolated from *Justicia procumbens* suppresses the growth of HT-29 cells transplanted into NOD-SCID mice, suggesting chemotherapeutic potential of the compound on colorectal cancer cells (Lee *et al.*, 2005). Also, justicidin A from *Justicia procumbens* var *leucantha*, to KKAY mice lowered blood leptin, inhibited increases in body weight, blood glucose, plasma triglycerides, plasma free fatty acids, and plasma HDL and LDL/VLDL cholesterol and lowered liver triglycerides (Taketomi, 2010). *Justicia spicigera* is reported in Saudi folk medicine as anti-inflammatory, antidysenteric and stimulant (Ageel *et al.*, 1987). The fresh leaves of *Justicia adhatoda* Nees are used in India to treat scabies and ringworm infection (Singh and Singh, 2009). Sepulveda-Jimenez *et al.* (2009) reported that *Justicia spicigera* is a source of antioxidant and supported its use as an anti-inflammatory for the treatment of uterine cancer and against various free radical-related disorders.

Justicidin B, isolated from *Justicia pectoralis* exhibited antileukemic activity *in vitro* (Joseph *et al.*, 1988a). The lignans, isolated from *Justicia procumbens* showed strong antiviral activity (Asano *et al.*, 1996) and potent cytotoxic effects against a number of cancer cells *in vitro* (Day *et al.*, 2002). The anti-inflammatory, antiulcer (Sanmugapriya *et al.*, 2005a,b), and hepatoprotective (Srivastava and Bhadur, 2006) activities of *Justicia prostrata* have been reported.

The genus *Justicia* is represented in Egypt by 2 species.

- 1.4.1. *Justicia heterocarpa* T. Anderson, J. Linn. Soc. London Bot. 7: 41 (1864); Boulos, Fl. Egypt 3: 103 (2002).
subsp. *heterocarpa*

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A podophyllotoxin lignin (111), β -sitosterol, stigmasterol, hexahydrofarnesylacetone, farnesylacetone, phytol, 4,8,12-tetramethylheptadecan-4-olide, farnesyl acetate and the fatty acids palmitic, linoleic, oleic and stearic acids were identified from the plant (Al-Juaid and Abdel-Mogib, 2004)

- 1.4.2. *Justicia ladanoides* Lam., Tabl. Encycl. 1(1): 42 (1791); Boulos, Fl. Egypt 3:103 (2002).
Syns. *Justicia kotschy* (Hochst.) Dandy in F.W. Andrews, Fl. Pl.Sudan 3: 180 (1956); Täckh., Stud. Fl. Egypt, ed. 2, 503 (1974).

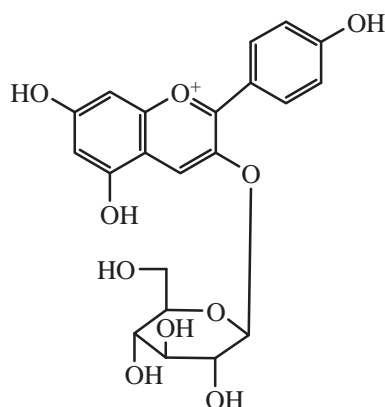
Nothing has been reported about the constituents and/or biological activities of this species.

1.5. **PERISTROPHE** Nees

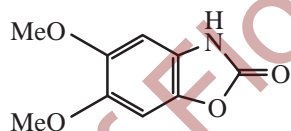
β -Sitosterol, stigmasterol, *n*-octacosanol, a saturated monocarboxylic acid (Liu *et al.*, 2006), β -ergosterol (Liu *et al.*, 2007), *n*-octadecane, cholest-5-en-3 β -oxyl hexadecanoate, octadecanoic acid, palmitic acid, stigmasterol, stigmasteryl glucoside, β -sitosterol glucoside, lupeol, and allantoin (Wang *et al.*, 1992; Pi *et al.*, 2008) were identified in *Peristrophe japonica*. Pelargonidin-3 β -glucoside (150) was identified from the leaves (Wei *et al.*, 1989)

and fresh branches of *Peristrophe lanceolaria* (Zheng *et al.*, 1992). A total of 31 compounds were identified in the volatile oil of the aerial parts of *Peristrophe baphica*. The major components were coumarin (53.66%), coumaran (9.18%), 1-octen-3-ol (10.00%), *trans*-3-hexen-1-ol (5.85%), 3-octanol (3.86%), benzyl alcohol (1.69%), linalool (1.22%), *o*-tolualdehyde (5.37%) and *p*-vinyl guaiacol (3.96%) (Xie *et al.*, 2008).

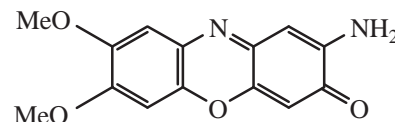
Betaine and trigonelline (quaternary amino acids) were detected in *Peristrophe speciosa* (Roxb.) Nees (Fischer *et al.*, 1988). Zilamine was isolated from *Peristrophe baphia* (Xie *et al.*, 2003). Naturally occurring derivatives of pyridine, 3,5-pyridine dicarboxamide (Wang *et al.*, 1992), sesamine, wogonin and succinic acid were identified in *Peristrophe japonica* (Liu *et al.*, 2007). Peristrophamide (**151**), and peristrophine (**152**), were isolated from *Peristrophe roxburghiana* (Qin *et al.*, 1999).



150 Pelargonidin-3 β -glucoside



151 Peristrophamide



152 Peristrophine

Folk Medicine, Pharmacological and Biological Activities

Zilamine, isolated from *Peristrophe baphia* can be used to prepare health-care food and medical preparations for preventing and treating hepatitis B, *diabetes mellitus* and lipid oxidation and also as the colouring matter (Xie *et al.*, 2003). A preparation from *Peristrophe* herbs is effective in inhibiting hepatitis B virus, improving liver function, protecting liver and proving immunity (Yang, 2005). Also, *Peristrophe japonica* can be applied for preventing and treating viral hepatitis, hepatic injury as well as drug and chemical hepatic injury, and has the advantages of obvious curative effect, low toxicity, high safety and high reliability (Gong *et al.*, 2010). *Peristrophe japonica* tea bag has detoxifying effect, and is suitable for cold, throat gall, and wean hyperpyrexia with advantages of good and quick effect (Xie, 2009).

Peristrophe roxburghiana has been found to decrease the blood pressure (Zhuang *et al.*, 2003; Cheng *et al.*, 2004). The plant extract can improve the hemorheological parameters and inhibit the formation of thrombosis (Yang *et al.*, 2002). It also possesses regulating action on the serum lipid, blood glucose and insulin, and improving liver functions of fatty liver rats induced by high-fat-sugar diet (Liu and Lü, 2007).

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

1.5.1. *Peristrophe paniculata* (Forssk.) Brummitt, Kew Bull. 38: 451 (1983); Boulos, Fl. Egypt 3: 103 (2002).

Syns. *Dianthera paniculata* Forssk., Fl. Aegypt.-Arab. 7 (1775).

Peristrophe bicalyculata (Retz.) Nees in Wall., Pl. As. Rar. 3: 113 (1832); Täckh., Stud. Fl. Egypt, ed. 2: 503 (1974).

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Petunidin 3-rhamnoglucoside was identified from the flowers of *Peristrophe bicalyculata* (Tiwari *et al.*, 1978). The plant contains vitexin 4-methyl ether and several phenolic acids *viz.* salicylic, *p*-hydroxybenzoic, protocatechuic, syringic and ferulic acids (Daniel and Sabnis, 1987). The isolation of 14-methyl-tritriacont-14-en-15-ol (**153**) and 35-hydroxynonatriacontanal (**154**) from the aerial parts of *Peristrophe bicalyculata* Nees, growing in India was reported (Singh *et al.*, 2000). β -Caryophyllene (33.9%), α -zingiberene (10.4%), germacrene D and globulol (5%) were reported as the major compounds of the oil of *Peristrophe bicalyculata* (Ogunwande *et al.*, 2010).



153 14-Methyltritriacont-14-en-15-ol

154 35-Hydroxynonatriacontanal

Peristrophe bicalyculata is used in India for its antibacterial property (tuberculostatic), snake poison, in bone fracture, sprain, fever, cold, cough and for ear and eye treatments (Gaudani *et al.*, 2010). The antibacterial (Chopra and Chopra, 1959) and antifungal (Quereshi *et al.*, 1997) properties of *Peristrophe bicalyculata* have been reported. The antifungal activity of sitosterol isolated from the plant has been proved and the compound can be useful in controlling plant diseases under field conditions (Singh *et al.*, 1994). The plant is used as an antidote for snake poison, antinematode and pesticide (Singh *et al.*, 2000). The ethanolic extract of *Peristrophe bicalyculata* possesses anti-inflammatory and analgesic activities (Rathi *et al.*, 2003). The oil of *Peristrophe bicalyculata* displayed *in vitro* cytotoxicity to MCF-7 (human breast tumour) and MDA-MB-468 (human breast tumour) cells (Ogunwande *et al.*, 2010).

The toxicity studies of *Peristrophe paniculata* in Wistar rats showed that both the aqueous and methanol extracts were devoid of any toxicity at the dose level 200 mg/kg/day (Chandran *et al.*, 2008).

1.6. RUELLIA L.

Constituents

Glucose and fructose were the main free sugars present in the underground organs of *Ruellia gemniflora*, followed by sucrose and other oligosaccharides. The soluble protein amounted to 9.6% (Figueiredo-Ribeiro *et al.*, 1986). The amino acids leucine, tyrosine, valine and glycine were identified in *Ruellia tuberosa* (Behari and Goyal, 1984).

The leaves of *Ruellia prostrata* Poir. yielded a mixture of sterol containing stigmasterol (75.33%), sitosterol (17.6%), 24-methylcholesterol (7.04%), cholesterol (trace) and