Ardisia elliptica

Scientific Name

***Ardisia elliptica* Thunberg.**

Synonyms

Anguillaria solanacea (Roxb.) Poir., *Ardisia hainanensis* Mez, *Ardisia humilis* (Vahl.) Kuntze, *Ardisia ketoensis* Hayata, *Ardisia littoralis* Andr., *Ardisia polycephala* Wall., *Ardisia pyrgina* Saint Lager, *Ardisia pyrgus* Roemer & Schultes, *Ardisia solanacea* Roxb., *Ardisia squamulosa* Presl, *Bladhia elliptica* (Thunb.) Nakai, *Bladhia kotoensis* (Hayata) Nakai, *Bladhia solanacea* (Roxb.) Nakai, *Icacorea solanacea* (Roxb.) Britton, *Tinus humilis* (Vahl) Kuntze, *Tinus squamulosa* (Presl) Kuntze.

Family

Myrsinaceae also placed in Primulaceae

Common/English Names

Duck's Eye, Elliptical-Leaf Ardisia, Inkberry, Seashore Ardisia, Shoebutton, Shoebutton Ardisia.

Vernacular Names

Burmese: Krak-Ma.Oak;
Chinese: Ai Zi Jin Niu, Dong Fang Zi Jin Niu, Suan Tai Cai;
Cook Islands: Venevene Tinitō, Vine Tinitō (Maori);
French: Ardisie Elliptique, Ati Popa'a;
India (Orissa): Nbong Thithi (Bonda), Kitti Gocho (Gadaba), Kutti, Lidi Kutti, Reedikki (Kondh), Goli (Poraja);
Indonesia: Buni Keraton;
Malaysia: Rempenai, Mempanai, Cempenai, Penai, Buah Letus, Kayu Lampilan, Duan Bisa Hati, Mata Ayam, Mata Itek, Mata Pelanduk;
Pakistan: Halad;
Philippines: Bahagion (Bisaya), Kolen (Iloko), Katagpo (Tagalog);
Samoan: Togo Vao;
Tahitian: Ati Popa'A, Atiu;
Thailand: Ramyai (Southern), Langphisa (Eastern), Thurang Kasah, Cham, Pak Cham.

Origin/Distribution

Native distribution of the species is uncertain although the original range has invariably included India, Sri Lanka, China, Taiwan, Southeast Asia – Thailand, Vietnam, Malaya, Indonesia, New Guinea and the Philippines.

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Agroecology

In its native range, it occurs as understorey in tidal swamps, mangroves habitats in the warm humid coastal zones as an understorey bush as well moist ravines and forests up to altitude of 1,200 m. It also establishes well in natural areas such as riparian habitats, hammocks, marsh islands, cypress stands, wet forests, monsoonal forests and in disturbed systems such as altered wetlands and fallow fields. The species is shade tolerant and is frost sensitive.

Edible Plant Parts and Uses

The fruit (Plate 5) is edible and taste slightly sour and lacks flavour. Young leafy shoots (Plate 2) can be eaten raw or cooked. In Orissa, the fruit are eaten by the Kondh, Poraja, Gadaba and Bonda tribal communities and the leaves used as vegetable by the Gadaba tribal community (Franco and Narasimhan 2009).

Plate 1 Flowers of *Ardisia elliptica*

Plate 2 Juvenile leaves

Botany

Branched glabrous, evergreen shrub up to 4 m tall with terete almost perpendicular branchlets. Leaves alternate, ovate, obovate or oblanceolate, 15–18×5–7 cm, leathery, glabrous, inconspicuously pellucid punctate, scrobiculate, base cuneate and slightly decurrent on petiole (4–8 mm long), margin entire, apex broadly acute to obtuse; with 12 prominent lateral veins on each side of midrib, marginal vein absent, coriaceous, pink-bronze when young turning dark green with age (Plates 2 and 3). Inflorescences terminal, subumbellate or cymose in pyramidal panicles, 8–17(–20) cm. Flowers pink or purplish red, 5–6 mm (Plate 1). Sepals broadly ovate, 1–2 mm, glabrous, punctate, base subauriculate, margin entire, apex acute. Petals nearly free, broadly ovate, inconspicuously pellucid and glabrous. Stamens subequalling petals with oblong-lanceolate, apiculate anthers. Ovary punctate, glabrous with numerous ovules in three series. Fruit dull red or purplish black, globose, 5–6 mm in diameter, densely punctate, on 1.5 cm long pedicel, form in dense clusters (Plates 4 and 5), containing a single spherical seed.

Plate 3 Mature leaves

Plate 4 Young fruit cluster

Plate 5 Mature and ripe fruits

Nutritive/Medicinal Properties

The genus *Ardisia* including *A. elliptica* was found to be a rich source of novel and biologically potent phytochemical compounds and to have the potential as a source of therapeutic agents (Kobayashi and de Mejía 2005).

Brazilian scientists reported that the major anthocyanin pigment in fruits of *A. humilis* was found to be malvidin-3-galactoside (Baldini et al. 1995). Others were delphinidin-3-glucoside, petunidin-3-galactoside, malvidin-3-glucoside and peonidin-3-glucoside. The anthocyanin content ranged from 547 to 613 mg/100 g fresh fruit. The benzene extract of the defatted leaves of *Ardisia solanacea* contained triterpenoid alcohols which, isolated and characterized, were: bauerenol, α-amyrin, β-amyrin (Ahmad et al. 1977).

TLC-densitometry of extracts revealed that the bergenin content was the highest in *Ardisia elliptica*, of 17 *Ardisia* species found in China (Liu et al. 1993). Bergenin was reported as a potent phytochemical with pharmacological attributes (Kobayashi and de Mejía 2005; see notes on *A. crenata*).

Anticancer Activity

Ardisia elliptica was found to have anticancer and antiviral activity. *Ardisia elliptica* plant extract was 1 of 9 Thai medicinal plants that exhibited antiproliferative activity against SKBR3 human breast adenocarcinoma cell line using MTT assay (Moongkarndia et al. 2004).

Antiviral Activity

Hot water extract of *Ardisia squamulosa* was found more effective in inhibiting adenovirus ADV-8 replication than the other four viruses (ADV-8, ADV-11, herpes simplex virus – HSV-1, HSV-2) (Chiang et al. 2003). Cell cytotoxic assay demonstrated that the tested hot water extract had CC_{50} values higher than their EC_{50} values.

Antiplatelet Activity

In recent studies, β-amyrin isolated from *A. elliptica* was found to be more potent than aspirin in inhibiting collagen-induced platelet aggregation (Ching et al. 2010). The IC_{50} value of β-amyrin was found to be 4.5 μg/ml (10.5 μM) while that of aspirin was found to be 11 μg/ml (62.7 μM), indicating that β-amyrin was six times as active as aspirin in inhibiting platelet aggregation. The leaf extract was found to inhibit platelet aggregation with an IC_{50} value of 167 μg/ml. The study showed that *A. elliptica* leaves inhibited collagen-induced platelet aggregation and one of the bioactive components responsible for the observed effect was determined to be β-amyrin.

Antibacterial Activity

Ardisia elliptica was also found to have antimicrobial activity. A hexane extract of its leaves afforded fractions containing hydrocarbons, apolar and polar fatty esters, triterpenoid alcohols (bauerenol; α-amyrin and β-amyrin), sterols (β-sitosterol) and polar compounds (Khan et al. 1991). The polar fraction was the most effective, being active at 5 mg/ml against *Pseudomonas aeruginosa* and at 2.5 mg/ml against nine other bacteria. The triterpenoid fraction (the largest fraction, comprising 38.6% of the total) at 10 mg/ml was active against all ten bacteria (7 Gram-positive and 3 Gram-negative); the sterol fraction was the only fraction inactive against all the bacteria. In another study, dried fruit extracts of *Ardisia elliptica* exhibited antibacterial activity against veterinary *Salmonella* (Phadungkit and Luanratana 2006). Three active anti-*Salmonella* compounds were isolated, namely, syringic acid, isorhamnetin and quercetin. The minimal inhibitory concentrations (MICs) of the isolated compounds ranged between 15.6 and 125.0 μg/ml.

Antiplasmodial Activity

Leaf extract of *A. humilis* was reported to have antiplasmodial activity against *Plasmodium falciparum* D10 strain (sensitive strain) but had no cytotoxic activity towards Madin-Darby bovine kidney cells. (Noor Rain et al. 2007).

Traditional Medicinal Uses

The genus *Ardisia* is widely used as the traditional medicine to cure diseases, e.g. pulmonary tuberculosis, hepatitis, chronic bronchitis and irregular menstruation (Kobayashi and de Mejía 2005). Its roots are used in Pakistani traditional medicine against fever, diarrhoea and rheumatism (Khan et al. 1991). In folkloric medicine, the leaves or roots are boiled and a decoction drunk for pains at the heart. The leaves or the roots are used to treat fever, diarrhoea and liver poisoning (Burkill 1966). In traditional Thai medicine *A. elliptica* has antipyretic activity and is used in diarrhoea, gonorrhoea and venereal diseases (Moongkarndia et al. 2004). It a medicinal plant traditionally used for alleviating chest pains, treatment of fever, diarrhoea, liver poisoning and parturition complications in Malaysia (Ching et al. 2010). In Orissa, India, the fruit is used for fits by the Kondh tribal community and for eye pain by the Poraja tribal community (Franco and Narasimhan 2009).

Other Uses

The plant is a popular ornamental for growing in pots or in garden landscape. The plant is useful for fuel and for use as vegetable stakes.

Comments

Frugivorous birds attracted to the numerous red to blackish fruits are the principal dispersal agents.

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