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# TAXONOMY OF SCROPHULARIACEAE FROM NARA DESERT, PAKISTAN

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**Abstract**

Five plant species of the genera *Anticharis*, *Bacopa*, *Kickxia* and *Schweinfurthia* were collected from Nara Desert during 1998-2004. They were taxonomically determined and have been described for the first time from this area. Since, these species are narrowly distributed; therefore efforts should be made to conserve them.

## Introduction

The family Scrophulariaceae commonly known as Figwort Family is comprised of mostly herbs or sometimes small shrubs of about 269 genera and 5100 species cosmopolitan predominately in temperate and Tropical Mountain (Philcox, 1990; Mabberley, 1997). Earlier, Chaudhari & Chuttar (1966) carried out a preliminary survey on Range Flora of Thar Desert and published a checklist of 122 species from this region. They reported 3 species of Scrophulariaceae family. Later on, a part of Thar Desert (Nara Region) was surveyed by Qureshi (2004) who recorded a total of 160 species belonging to 118 genera and 45 families. In addition, the authors reported floristic and ethnobotanical observations from some parts of this region (Bhatti *et al.*, 1999; 2001; Qureshi, 2002). The detailed ecology and vegetation of this region are reported by Qureshi & Bhatti (2005a & b; 2007a & b). Since, the family Scrophulariaceae is poorly known and not so far published from Pakistan, an attempt has been made to report the members of this family from the study area. Present paper is the only source of systematic account of this family from this region.

## Material and Methods

Plant specimens were collected from Nara Desert, Sindh, Pakistan during 1998-2004. They were described, identified with the help of authentic literature (Jafri, 1966; Bhandari, 1978; Philcox, 1990). The voucher specimens were matched with already determined specimens at Pakistan Museum of Natural History, Islamabad and deposited in the Herbarium of Shah Abdul Latif University, Khairpur, where the research work was carried out. Additionally, vernacular names of plants collected from the study area are also provided.

## Results and Discussion

The floristic survey of study area was carried out with regular intervals in spring and summer seasons during 1998-2004 for the collection of plant specimens. Five plant species distributed across 4 genera of Scrophulariaceae family have been identified. Their taxonomic enumerations are given below:

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***Scrophulariaceae*** Juss., nom. cons.

Erect or prostrate, marsh or aquatic herbs, or small shrubs, rarely root parasites. Leaves all decussate or alternate, often both, rarely ternate or whorled, simple or pinnatifid, petiolate or subsessile, exstipulate. Flowers irregular, rarely sub-irregular, 4-5-merous, axillary, solitary or in terminal, lax racemes, cymes or pedunculate capitate clusters, subsessile or pedicellate; pedicels elongating in fruit; bracts and bracteoles present or 0. Calyx-lobes 4-5, equal or unequal, connate or distinct, valvate or imbricate, persistent. Corolla tubular, 2-lipped; lobes 4-5, (sub)equal or unequal, imbricate, rarely rotate, membranous; upper lip outer, rarely inner in bud. Stamens usually 5, sometimes 4 or 2, with or without staminodes, included or rarely exserted; filaments equal, or if didynamous, upper pair shorter; anther 2- or 1-celled, sessile or stipitate, distinct, contiguous, parallel or divericate, rarely transverse, dehiscence longitudinal, introse; connectives broad; staminodes minute, linear, simple or forked. Gynoecium with 2 connect carpels; ovary superior, globose or conical, 2 or imperfectly 4-locular; ovules few-many, on swollen, axile placentae, anatropous or amphitropous; style terminal, simple or dilated; stigma 2-lamellate, 2-lobed, capitate or simple. Disc annular, cupular or unilateral, glandular, hypogynous. Capsule oblong-lanceolate, cylindric or compressed, loculicidal or septicidal, or both, 2-4-valved, or irregularly rupturing; epicarp thin. Seeds few to many, minute, angular, truncate or globose; testa smooth, reticulate or rugose; septa and valves persistent.

The present collection includes the following 4 genera, which may be distinguished as follows:

1a. Stamens 2 .....……..…….... **1. *Anticharis***
1b. Stamens 4

2a. Corolla-tube spurred at base …..……...…. **2. *Kickxia***
2b. Corolla-tube not spurred at base:

3a. Upper 2 stamens with perfect anthers; lower 2 reduced to staminodes .... **3. *Bacopa***
3b. Stamens all perfect, didynamous ……..……..... **4. *Schweinfurthia***

**1. Anticharis**

Endl., Nov. Strip. Dec. 22, Gen. 682 (1839)

A genus of 14 species distributed from Africa to Asia (Mabberley, 1997). Two species are recorded from the study area.

**Key**

1a. Leaves ovate, not exceeding 1.8 cm in length, pedicels less than twice as long as the Calyx ……. ***A. glandulosa***
1b. Leaves narrowly linear, exceeding ca. 2.5 cm in length, pedicels more than twice as long as the calyx ……... ***A. linearis***

**1. *Anticharis glandulosa*** Aschers. in Monatsb. Akad. Wiss. Berl, 800 (1866).
(Local Name: *Gaamesh* (Sindhi)

An erect, branched leafy herb up to 20 cm high, densely clothed with viscid glandular hairs. Leaves 1-3 x 0.5-1.5 cm in size, ovate-oblong, or oblong-lanceolate, apex

subobtuse, margin entire, densely glandular-pubescent, narrowed into a short flattened often obscure petiole, which is up to 5 mm long. Flowers solitary (very rarely 2 together), axillary; pedicel slender, glandular hairy; peduncle ca. 4-5 mm long. Bracts 2, about the middle of pedicel, linear-spathulate, glandular hairy, reaching ca. 5 mm long. Calyx ca. 5 mm long, divided at the base; lobes oblanceolate or more or less spathulate, apex acute-obtuse, margin ciliate, glandular-hairy. Corolla ca. 1-1.5 cm long, pink, rosy or blue; lobes broad, rounded. Filaments short, filiform, glabrous; anthers versatile, curved, the segments unequal. Ovary ovoid, glabrous, seated on a somewhat cup-shaped disk; style glabrous. Capsule ca. 8-10 mm long, narrowly ovoid, acuminate, pubescent. Seeds oblong, truncate, longitudinally striately ribbed, ca. 0.5 mm.

**Flowering period:** October-May.
**Herbarium specimens examined:** NARA DESERT: *Rahmatullah Qureshi*, 946, 955, 967, 1018 (HERB. SALU).
**Distribution:** Found in Upper Egypt (Cooke, 1906).
**Remarks:** A rare plan restricted to rocks and found in foothills of Rohri hills.

**2. *A. linearis*** (Benth.) Hochst. ex Aschers. in Monatsb. Akad. Wiss. Berl. 882 (1866). (Local Name: *Dhunnya*).
Syn: *Doratanthera linearis* Benth. in DC., Prodr., x: 347 (1846).

An erect, much branched, glandular pubescent annual upto 35 cm long. Branches ascending. Leaves 2-5 x 0.2-0.4 cm in size, linear to narrowly lanceolate, hairy on both surfaces. Peduncles solitary, axillary, filiform, deflexed above in fruit, glabrous near the base and glandular at the apex; bracts 1-3 mm long, inserted little above the middle of peduncle, opposite subopposite, linear, glandular, hairy. Calyx 5 mm long, divided near the base, segments linear, acute, glandular hairy. Corolla pale-purple, exceeding the calyx, divided scarcely ¼ down way. Style glabrous. Capsules ca. 7 mm long, ovoid, acuminate, pubescent, many seeded. Seeds oblong-lanceolate, longitudinally striately ribbed.

**Flowering period:** October-May.
**Herbarium specimens:** NARA DESERT: *Rahmatullah Qureshi*, 1057, 1175 (HERB. SALU).
**Distribution:** Found in Upper Egypt (Cooke, 1906).
**Remarks:** A rare species confined to hilly area and observed in depression of Rohri hills.

### 2. *Kickxia*

Dumort. Fl. Belg. 35 (1827); Jafri, Fl. Kar., 303 (1966).

A genus of 47 species (Mabberley, 1997). One species is recorded from this area.

**3. *Kickxia ramosissima*** (Wall.) Janchen in Oesterr. Bot. Zeitech., 1xxxii: 152 (1933); Jafri in Fl. Kar. 303 (1966); Stewart in Ali & Nasir, Ann. Cat. Vasc. Pl. W. Pak. & Kashm., 649 (1972). (Local Name: *Kanodi*)
Syn: *Linaria ramosissima* Wall. Pl. As. Rar., ii: 43, t. 153 (1831); *Elatinoides ramosissima* (Wall.) Wetstt. in Engl. Prantl. Pflanzen., 4 (36): 58 (1891).

A perennial decumbent herb. Stem much branched, delicate; branches filiform, thin, up to 45 cm high. Leaves alternate, triangular-hastate, apex acute, margin entire, ca. 6-40 x 3-25 mm in size, the lower ones 5-7-lobate, the upper lanceolate-sagittate, glabrous or the lower sometime pubescent. Flowers small, yellow, about 1 cm long, solitary on axillary filiform pedicels; pedicel ca. 1-3.5 cm long, terete, ebracteate. Calyx-tube ca. 2-3 mm; lobes linear-lanceolate, membranous towards the base, apex acute. Corolla 5-10 mm long, pubescent outside; spurr ca. 2.5 mm long; upper lip ca. 0.3 mm, oblong, obtuse; the lower lip ca. 0.5 mm long, oblong, obtuse, yellow in colour. Stamens didynamous; filaments with few long hairs at the base, more or less papilose above. Ovary globose; style stout, ca. 0.5 mm long, glandular-pubescent. Capsule globose-ovoid, opening on one side by a valve and other side by a subapical pore, ca. 3 mm across. Seeds small, brown, echinate.

**Flowering period:** November-January.
**Herbarium specimens examined:** NARA DESERT: *Rahmatullah Qureshi*, 560, 1176 (HERB. SALU).
**Distribution:** India, W. Pakistan, Afghanistan and Iran (Jafri, 1966).

### 3. *Bacopa*

Aublet, Hist. Pl. Gui. France 1: 128. t. 49 (1775)-*nom. Cons.*

A genus of 56 species (Mabberley, 1997). One species is recorded from the study area.

**4. *Bacopa monnieri*** (Linn.) Wettestein in Engl. & Prantl. Pflanzenfan. 5 (36): 77 (1891). Syn: *Lysimachia monnieri* L., Cent. Pl., ii: 9 (1756); *Gratiola monnieri* L lc, 120; *Monniera cuneifolia* Michaux, FL. Bor. Amer. I: 22 (1803); *Herpestris monnieri* (L.) HB. & K.,Nov. Gen. et Sp., ii: 366 (1816); *Bacopa monnieri* (L.) Wettest. In New Man. Bot., 724 (1908); *Brami monnieri* (L.) Pennell, Scrop. South U.S. in Proc. Aca. Nat. Sc. Philad., *71*: 243 (1920). (Local name: Jal Neem Buti).

A glabrous, somewhat succulent, creeping herbs, rooting at the nodes with numerous prostrate branches, each 10-30 cm long, leaves obovate-oblong, obtuse, sessile, decussate, 1-2.5 x 0.3-0.8 cm in size, ± fleshy, entire, punctuate, obtuse. Flower axillary, solitary, pale violate; peduncles 1-1.5 cm long, often much longer and deflexed in fruiting stage; bracteoles 5 mm long, linear, obtuse. Calyx divided to base; posticous segment broadly ovate, 6 x 3-4 mm, obtuse, the other 4 segments slightly sorter than the anticous segments acute, slightly narrower. Corolla gamopetalous, funnel like, white or pinkish with purple blotches, 10-12 mm long, lobes subequal, rounded and glabrous. Stamens 4, didynamous, included. Ovary 2-chambered.

**Flowering & fruiting period:** January-June.
**Herbarium specimens examined:** NARA DESERT: *Rahmatullah Qureshi*, 1195, 1206 (HERB. SALU).
**Distribution:** All warm countries including W. Pakistan and Afghanistan (Jafri, 1966), Ceylon, India, Rajputana, (Bhandari, 1978).
**Remarks**: A plant found in salt lakes of Nara Desert.

### 4. *Schweinfurthia*

A. Braun, Sitzb. Ges. Naturf. Fr. xx: 24 (1866).

A genus of about 6 species distributed in N.E. Africa, Arabia, Afghanistan, Pakistan and India (Mabberley, 1997). One species is recorded from the Nara Desert.

**5. *Schweinfurthia papilionacea*** (Burm. f.) Boiss., Fl. Or. Iv: 387 (1879); Jafri in Fl. Kar. 304 (1966); Stewart in Ali and Nasir, Ann. Cat. Vasc. Pl. W. Pak. & Kashm., 659 (1972) (Local Name: *Akri* (Sindhi)

Syn: *Antirrhinum papilionaceum* Burm. f., Fl. Ind., 121, t. 39, f. 2 (1789); *A. glaucuma* Stocks in Wight, Icon. T. 1459 (1850). *Linaria sphaerocarpa* Benth. in DC., Prodr. X: 287 (1846); *Schweinfurthia sphaerocarpa* (Benth) A. Braun. in Montsb. Akad. Wiss. Berl., 875 (1866).

A glaucous glabrous sub-succulent, erect herb up to 30 cm long, from a perennial root. Stem ascending, succulent, glaucous, much branched at the base. Leaves ca. 1-3 x 0.5-2.5 cm in size, ovate-spathulate, or orbicular-obovate, apex subacute-apiculate, margin entire, attenuated at the base into a short petiole, sparsely clothed on both sides with very minute hairs, rarely glabrous. Flowers axillary, ca. 12 mm, deflexed in fruit. Calyx 5-partite; upper segments broadly ovate-subcordate, apex acute, veined; rest lanceolate, apex acute, margin entire. Corolla-tube ca. 5 mm long, white, with purple veins; upper lip 2-lobed, oblong, apex obtuse, ca. 4-5 mm long; lower lip 3-lobed, spreading, the lobes oblong, apex obtuse, ca. 7 mm long. Capsule obliquely globose, 2-celled, lower cell many seeded, upper cell few-seeded. Seeds obconic, truncate at both ends, acutely winged, pale.

**Flowering period:** November-February.
**Herbarium specimens:** NARA DESERT: *Rahmatullah Qureshi*, 668, 800, 805, 886, 1177, 1204, 1215, 1239 (HERB. SALU).
**Distribution:** Rajputana, Pakistan and Afghanistan (Jafri, 1966).
**Remarks**: A rare plant mostly found in interdunal valleys and in depressions of Rohri Hills.

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