

Family 26. MORACEAE

A. G. MILLER

Monoecious or dioecious trees, shrubs or herbs; sap milky or watery. Leaves alternate or subopposite, simple or lobed; stipules present. Inflorescences bisexual or unisexual, of spikes or heads, on disc-shaped or clavate receptacles or inside hollow receptacles (figs). Flowers unisexual, actinomorphic; perianth segments (2–)4(–6) or absent; male flowers with 1–4 stamens; female flowers with an inferior or superior 1-celled ovary; ovule solitary, pendulous; stigmas 1–2. Fruit an achene or drupe, sometimes enclosed or immersed in the fleshy receptacle.

1. Herbs or shrubs with swollen, succulent stems or lacking an aerial stem but with an underground tuber; flowers on a flattened receptacle surrounded by ray-like appendages **3. *Dorstenia***
- + Woody trees or shrubs; flowers in various sorts of inflorescence but not as above **2**
2. Flowers borne inside a globose or obovate hollow receptacle (the fig) **4. *Ficus***
- + Flowers borne externally on catkin-like spikes or on discoid or clavate receptacles **3**
3. Female flowers borne in capitate heads; male flowers in spikes; leaves 3-nerved from the base **1. *Morus***
- + Female flowers solitary on clavate receptacles; male flowers numerous on discoid receptacles; leaves pinnately nerved **2. *Antiaris***

1. *MORUS* L.

Dioecious trees. Leaves alternate, entire, 3-nerved from the base; stipules small, lateral, free. Flowers in unisexual, axillary, pendunculate spikes. Male flowers in catkin-like spikes; perianth segments 4, fused at the base; stamens 4. Female flowers in short capitate spikes; perianth segments 4; stigmas 2. Fruit a drupe, enclosed by the enlarged fleshy perianth and forming a cylindrical or ovoid compound fruit.

Morus macroura Miq. is recorded from Saudi Arabia where it is rarely cultivated for its edible fruits. It is distinguished from *M. alba* and *M. nigra* by its larger (more than 5cm long) yellowish white fruits and its longer (more than 5cm) male spikes.

1. Ripe fruits dark purple to black; leaves usually unlobed; perianth of female flowers with long, soft hairs **1. *M. nigra***
- + Ripe fruits white or rarely purplish black; leaves usually lobed; perianth of female flowers glabrous or shortly pubescent **2. *M. alba***

1. *M. nigra* L., Sp. pl.: 986 (1753). Illustr.: Fl. Pakistan 171: 49 (1985).

Tree to up 10m. Leaves broadly ovate, usually simple, sometimes 2–3-lobed, 6–12 × 6–12cm, shortly acuminate, serrate, cordate at the base, scabrous above, pubescent beneath. Male spike 1.5–3cm long. Styles and perianths of the female flowers covered with long soft hairs. Mature fruit 2–2.5cm diam., dark purple to black. **Map. 84.**

Planted as a street tree.

Saudi Arabia, Yemen (N), Qatar, Bahrain. Widely cultivated in C & S Europe, N Africa, SW Asia, NW India and C Asia. Wild origin obscure.

The “Black Mulberry” – cultivated for shade and its edible fruit.

2. *M. alba* L., Sp. pl.: 986 (1753). Syn.: *M. alba* var. *arabica* Bureau in DC., Prodr. 17: 144 (1873); *M. arabica* (Bureau) Koidzumi in Bot. Mag. Tokyo 31: 35 (1917). Illustr.: Fl. Pakistan 171: 51 (1985).

Tree up to 5m. Leaves ovate, very polymorphic, usually at least some 3-lobed, rarely all simple, up to 10 × 8cm, acute or shortly acuminate, crenate-dentate, cordate at the base, glabrous or pubescent on the veins beneath. Male spike c. 1cm. Styles and perianth of the female flowers glabrous or shortly pubescent. Mature fruits 1–2.5cm diam., white or rarely purplish black. **Map. 85.**

Apparently naturalized in irrigated date gardens; 50–500m.

Oman. A native of China and E Asia, now widely cultivated in warm areas of the world.

The “White Mulberry” – food plant of the silkworm (*Bombyx mori*).

2. ANTIARIS Lescheu.

Monoecious or dioecious trees with milky latex. Leaves alternate. Stipules free, semi-amplexicaul. Flowers on receptacles on short axillary branches. Male flowers many, on a disc-shaped, pedunculate receptacle surrounded by 1–3 rows of bracts; perianth segments 2–7, free, stamens 2–4. Female flower solitary on a clavate, bracteate receptacle; perianth 4-lobed; stigmas 2. Fruit fused with the enlarged fleshy, orange receptacle.

1. *A. toxicaria* Lescheu. in Ann. Mus. Natl. Hist. Nat. Paris 16: 478, t. 22 (1810). Syn.: *A. challa* (Schweinf.) Engl., Veg. Erde 3(1): 33, t. 20 (1915); *Ficus challa* Schweinf. (1896 p.44). Illustr.: Fl. Trop. E. Afr.: 14 (1989); Fl. Ethiopia 3: 301 (1989).

Shrub or tree up to 20(–30)m. Leaves elliptic to oblong-elliptic or obovate, 10–16 × 5–10cm, shortly acuminate or obtuse, subentire, the base obtuse to subcordate, scabrous above, pubescent or scabrous beneath; petioles 3–9mm. Male inflorescence 0.5–0.8cm diam.; peduncle 0.5–1cm. Female inflorescence ellipsoid, 0.3–0.5cm × c.0.3cm; peduncle 0.5–1cm. Infructescence ellipsoid, ovoid or globose, 1–1.5 × 0.8–1cm. **Map 86, Fig. 13.**

Valley forest; 600–900m.

Yemen (N). Tropical Africa and tropical Asia.

Arabian material is all referable to subsp. *toxicaria* var. *africana* A. Chev. which is distinguished by its scabrous leaves with prominent venation beneath.

3. DORSTENIA L.

Monoecious herbs or shrubs; stems either succulent or plants stemless with an underground tuber; latex milky. Leaves alternate, crowded at the ends of branches or rising directly from the tuber, entire or toothed, rarely palmately lobed. Flowers minute, sunk into a flattened pedunculate receptacle which is fringed by linear or rounded, ray-like appendages. Male flowers with a 2–3 lobed perianth and 2–3 stamens. Female flowers less numerous; perianth with rudimentary lobes; style simple; stigma unbranched (in Arabia). Fruit a minutely tuberculate achene, explosively expelled.

Friis, I. (1983). The acaulescent and succulent species of *Dorstenia* sect. *Kosaria* from NE tropical Africa and Arabia. *Nord. J. Bot.* 3: 533–538.

- | | |
|---|--------------------------------|
| 1. Plants with underground tubers, lacking aerial stems; leaves cordate to reniform sometimes lobed | 2 |
| + Plants with succulent aerial stems; leaves narrowly elliptic to broadly obovate or circular | 3 |
| 2. Receptacle narrowly elliptic | 1. <i>D. barnimiana</i> |
| + Receptacles circular | 2. <i>D. socotrana</i> |
| 3. Herbs up to 50cm; stems cylindrical or arising from a tuberous basal part | 3. <i>D. foetida</i> |
| + Shrubs up to 2.5m; stems bottle-shaped | 4. <i>D. gigas</i> |

1. *D. barnimiana* Schweinf., Pl. quaed. nilot.: 36, t. 12 (1862). Syn.: *D. barnimiana* Schweinf. var. *ophioglossoides* (Bureau) Engl., Monogr. afrik. Pflanzen-Fam. 1: 25 (1898). Illustr.: Fl. Ethiopia 3: p.279 (1989).

Perennial herb, stemless with an underground tuber; tuber 2–6cm across. Leaves cordate to reniform, entire or rarely palmately divided, 2–10 × 3.5–11cm, rounded or bluntly acute, entire or irregularly denticulate, cordate or rounded at the base, glabrescent to puberulous; petioles 4–15cm. Receptacles 1–2 in the leaf axils, narrowly elliptic, 1–3.5 × 0.3–1cm; appendages linear, 0.4–6cm, evenly distributed or restricted to a few at the base and one at the apex; peduncles 4–12cm. **Map 87, Fig. 13.**

Amongst rocks on wadi-sides, terrace-walls, rocky slopes; 800–2500m.

Yemen (N & S). Tropical NE Africa.

2. *D. socotrana* A.G. Miller in Edinb. J. Bot. 53 (1996). Type: Socotra, *Miller et al.* 12647 (E).

Perennial herb, stemless with an underground tuber; tuber c.1cm across. Leaves cordate to reniform, entire, 0.8–2.5 × 0.8–2.8cm, rounded, entire or irregularly denticulate, cordate at the base, glabrous or minutely puberulous; petioles 1–8cm. Receptacles solitary in the leaf axils, circular, 3–5mm diam. (excl. appendages); appendages linear, 1–3mm, evenly distributed; peduncles 1–3cm. **Map 87.**

Cracks in limestone boulders; c.160m.

Socotra. Endemic.

3. *D. foetida* (Forsskal) Schweinf. (1896 p.120). Syn.: *D. radiata* Lam., Encycl. 2: 315 (1786); *Kosaria foetida* Forsskal (1775 pp. CXXI, 164). Illustr.: Fl. Ethiopia 3: p.279 (1989). Type: Yemen (N), *Forsskal* (C).

Succulent herb; stems swollen, succulent, cylindrical from a swollen tuberous base or branched and tuberous, marked with pronounced leaf scars. Leaves very variable, narrowly obovate to ovate or suborbicular, 2–18 × 1–2.5cm, acute to rounded, entire to crenate or dentate, often ± crisped, long-attenuate to rounded at the base, glossy green, glabrous to puberulous; petioles 1–3.5cm. Receptacle circular, 0.5–1.5cm diam., (excl. appendages); appendages linear, up to 3cm; peduncles 1–6cm. **Map 88, Fig. 13.**

D. foetida is an exceptionally variable species within which some rather ill-defined infraspecific taxa have been recognized. Plants from Arabia belong to subsp. *foetida* of which two varieties have been recognized.

- 1. Leaves narrowly ovate, obovate or elliptic, the margin crenate to toothed; petiole equalling or slightly shorter than the lamina var. **foetida**
- + Leaves broadly ovate to suborbicular, the margin entire; petiole equalling or longer than the lamina var. **obovata**

var. **foetida**. Syn.: *D. arabica* Hemsley in Hooker's Icon. pl. 26: t.2503 (1897).

Cliffs and rocky slopes in dry deciduous woodland and *Euphorbia balsamifera* shrubland; 100–1600m.

Saudi Arabia, Yemen (N & S), Oman. Sudan, Somalia and Ethiopia.

var. **obovata** (A. Rich.) Schweinf. & Engl. in Engl., Monogr. afrik. Pflanzen-Fam. 1: 27 (1898).

Cliffs and rocky slopes; 900m.

Yemen (N). Ethiopia and Sudan.

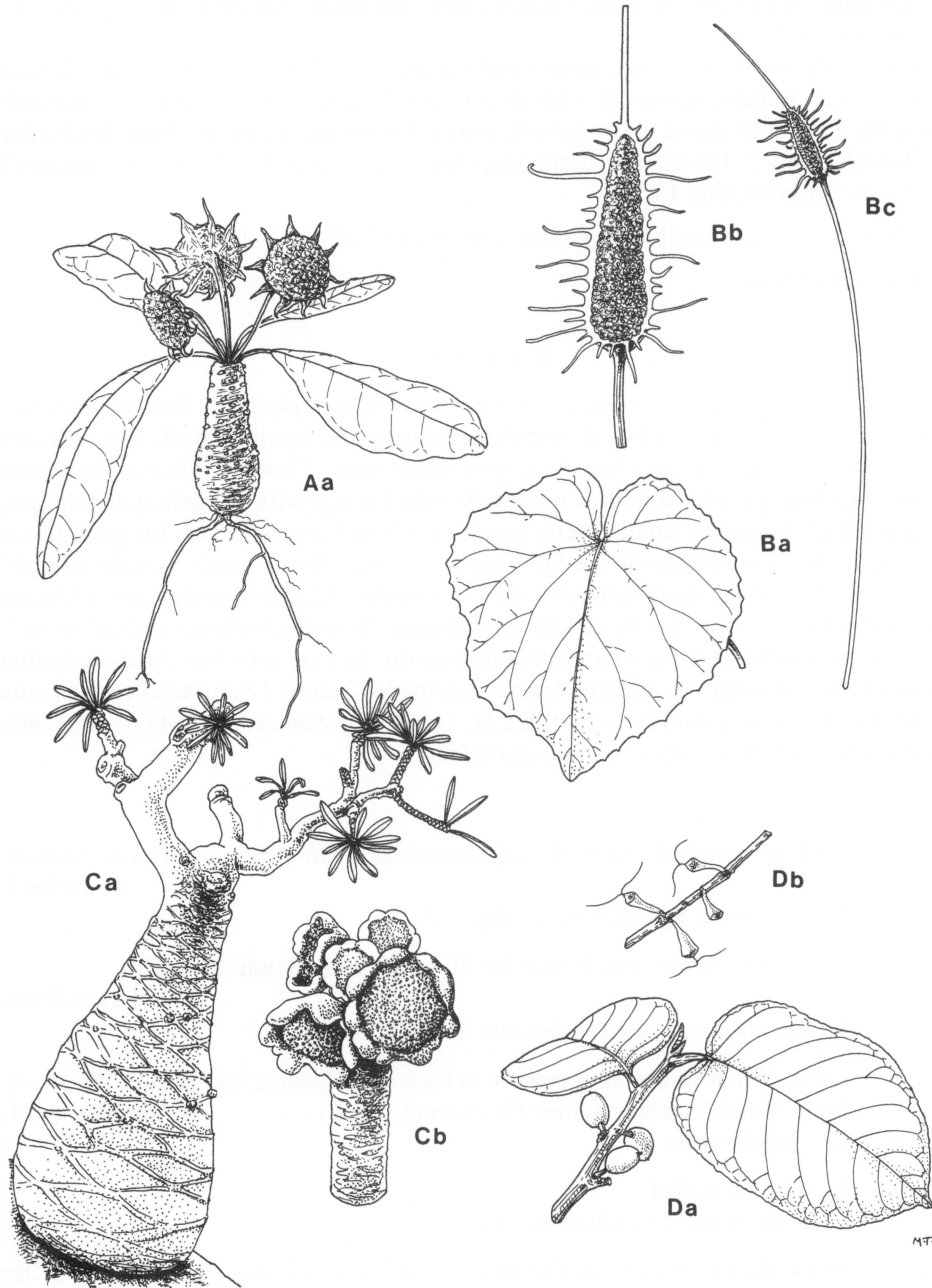


Fig. 13. Moraceae. A, *Dorstenia foetida*: Aa, habit ($\times 0.6$). B, *D. barnimiana*: Ba, leaf ($\times 1$); Bb, inflorescence ($\times 1$); Bc, inflorescence ($\times 0.5$). C, *D. gigas*: Ca, habit ($\times 0.15$); Cb, inflorescences ($\times 1.5$). D, *Antiaris toxicaria*: Da, fruiting branch ($\times 0.5$); Db, female inflorescence ($\times 0.5$).

4. D. gigas Schweinf. ex Balf.f. (1883 p.95). Syntypes: Socotra, *Balfour* 638 (E); *Schweinfurth* 737 (K).

Succulent shrub up to 2.5m; stems bottle-shaped, swollen, up to 1.5m across. Leaves dark green, bullate, narrowly obovate, $3-15 \times 1-3$ cm, acute or obtuse, obscurely crenate, attenuate into a short petiole, pubescent on the veins. Receptacle circular, yellowish green, 5-10(-2.5)mm diam.; appendages rounded, $1.5-3 \times 1-3$ mm; peduncle 5-20mm. **Map 89, Fig. 13.**

On steep, often inaccessible, limestone and granite cliffs; 600-1100m.

Socotra. Endemic.

4. FICUS L.

Monoecious or dioecious trees or shrubs, sometimes epiphytic. Leaves alternate, rarely opposite, entire or lobed. Stipules enclosing the terminal bud, free or partly fused, often caducous and leaving a prominent scar. Flowers minute, numerous, borne inside a specialised hollow receptacle - the fig; figs with a small apical opening (the ostiole) fringed by small bracts; bracts also found in a whorl on the peduncle or scattered over the surface of the fig. Flowers of three kinds: male, female and gall. Perianths 2-6-lobed; male flowers with 1-3 stamens; female flowers with a filiform style; gall flowers with a reduced style and stigma. Achenes enclosed within the fig.

A number of Asiatic species are cultivated as ornamentals and street trees in Arabia. A key to those so far recorded in Arabia is provided below. Useful keys to the exotic species of *Ficus* are found in Corner, E.J.H. *Gard. Bull. Singapore* 21 (1): 1-186 (1965) and Condit, I.J. *Ficus; the exotic species* (1969).

Key to cultivated species

1. Leaves 3-5-lobed; fruits obovoid (recorded from most countries in Arabia) **F. carica** L.
 - + Leaves entire; figs globose or ellipsoid 2
2. Leaves pandurate, the lamina $15-30 \times 12-20$ cm (Saudi Arabia) **F. lyrata** Warb.
 - + Leaves elliptic, ovate or obovate, never lyrate 3
3. Leaves finely pubescent beneath, at least when young; leaf lamina $10-20 \times 8-15$ cm (Saudi Arabia, Yemen (N), Oman, UAE) **F. benghalensis** L.
 - + Leaves glabrous 4
4. Leaf tips rounded 5
 - + Leaf tips acute, acuminate or caudate 6
5. Black glands present in the axils of the veins on the undersurface of the leaves; leaf lamina polymorphic, broadly obovate to deltate, $2.5-7.5 \times 1.5-5$ cm (Saudi Arabia) **F. deltoidea** Jack.
 - + Black glands absent; leaf lamina obovate or elliptic to obovate, $(3-5-10 \times (1.5-2-5 (-6)$ cm (Saudi Arabia) **F. microcarpa** L.f.

6. Leaves broadly ovate with a caudate tip; leaf lamina 6–25 × 4–10cm (Saudi Arabia, Oman) **F. religiosa** L.
 + Leaves ovate, elliptic or obovate, the tip acute or shortly acuminate 7
7. Leaves with more than 20 pairs of lateral veins; leaf lamina 15–30 × 5–15cm (Saudi Arabia, Oman, Qatar) **F. elastica** Roxb. ex Hornem.
 + Leaves with up to 15 pairs of lateral veins 8
8. Leaf venation obscure, the lateral veins parallel; leaf tips acuminate; leaf lamina 5–12 × 2–6cm (Saudi Arabia) **F. benjamina** L.
 + Leaf venation distinct, the lateral veins not parallel, \pm ascending; leaf tips acute or shortly acuminate; leaf lamina 5–10 × 3–7cm (Saudi Arabia) **F. amplissima** J.E. Smith.

Key to native and naturalized species

1. Leaves lobed, if unlobed leaves also present then the margins serrate 2
 + Leaves simple (see also *F. sycomorus* in which the leaves on sucker-shoots are rarely lobed), the margins entire or repand, never serrate 5
2. Sap watery; bracts scattered over the surface of the fig and peduncle; figs globose **4. F. exasperata**
 + Sap milky; bracts restricted to the ostiole and a single whorl at the base of the fig; figs pear-shaped 3
3. Figs 3–5cm diam; leaves up to 30 × 30cm **1. F. carica**
 + Figs less than 2cm diam.; leaves up to 15 × 15cm 4
4. Tip of leaves and leaf lobes obtuse to rounded or if acute then the lobes themselves lobed **3. F. johannis**
 + Tip of leaves and leaf lobes acute or acuminate, the lobes serrate but never lobed **2. F. palmata**
5. Figs 2–4cm diam., borne on leafless branchlets on the older wood 6
 + Figs 0.5–1.5(–2)cm diam., borne in the leaf axils 7
6. Twigs and petioles minutely puberulous and with long simple hairs; leaves usually with rounded tips **5. F. sycomorus**
 + Twigs and petioles with only one type of hair, either puberulous, tomentose or hirsute; leaves with acute or acuminate tips **6. F. sur**
7. Leaves scabrous, simple or sometimes the juvenile leaves lobed; sap watery; bracts scattered over the surface of the figs and peduncles **4. F. exasperata**
 + Leaves smooth, simple; sap milky; bracts restricted to the ostiole and the base of the fig 8
8. Leaves more than 3 × as long as broad; ostiole round, bracts visible 9
 + Leaves less than 3 × as long as broad; ostiole a slit; bracts not visible 10

- 9. Leaves usually lanceolate, glabrous, usually less than 3cm broad; basal lateral veins unbranched, \pm curved, running almost parallel to the leaf-margin
 7. *F. cordata* subsp. *salicifolia*
- + Leaves ovate to elliptic, scabrous, pilose or glabrous, 4–7cm broad; basal lateral veins usually branched, almost straight, not running parallel to the leaf margin
 8. *F. ingens*
- 10. Figs pedunculate; leaf tip acuminate
 10. *F. populifolia*
- + Figs sessile; leaf tip rounded or acute
 11
- 11. Leaves oblong; ostiole 2-lipped; leaves without a glandular patch
 9. *F. glumosa*
- + Leaves cordate; ostiole 3-lipped; leaves with a glandular patch on the lower surface near the base of the midrib
 11. *F. vasta*

1. *F. carica* L., Sp. pl.: 1059 (1753). Illustr.: Fl. Ethiopia 3: 281 (1989).

Shrub or small tree up to 10m. Sap milky. Leaves 3–5-lobed, broadly ovate in outline, c.10–20(–30) × 10–20(–30)cm, the leaves and lobes with acute to rounded tips, serrate, cordate at the base, scabrous above, scabrous, glabrescent or puberulous beneath. Stipules semi-amplexicaul. Figs 1–2 in the leaf axils, obovoid, 3–5cm diam., reddish, sessile or pedunculate; peduncles up to 3cm, bearing a whorl of 3–4 bracts. Ostiolar bracts visible. **Map 90, Fig. 14.**

Cultivated, occasionally naturalized.

Saudi Arabia, Yemen (N & S), Oman, Qatar, Bahrain.

Cultivated throughout the world for its edible fruit. Not known to occur naturally in the wild. See comments under *F. palmata*.

2. *F. palmata* Forsskal (1775 p.179).

Shrub or small tree up to 5m. Sap milky. Leaves simple or 2–3-lobed, ovate or suborbicular in outline, 2–15 × 1.5–8(–15)cm, the apex rounded or obtuse to acute or acuminate, serrate, truncate or subcordate at the base, scabrous above, scabrous to densely pubescent or glabrescent beneath. Stipules semi-amplexicaul, caducous. Figs 1–2 in the leaf axils, obovoid to globose, 1–2cm diam., pubescent, pinkish purple; peduncles 0.5–1.5cm, bearing a whorl of 3–4 bracts. Ostiole round, the ostiolar bracts visible. **Fig. 14.**

F. palmata, *F. johannis* and *F. carica* are a difficult complex of polymorphic species where species limits are often far from clear. *F. carica*, the cultivated fig, is thought to be of possible hybrid origin with the putative parents *F. johannis* and *F. carica* subsp. *rupestris* (see Browicz in Fl. Iranica 153: 9 (1982)).

In Arabia *F. palmata* is represented by two taxa: subsp. *palmata*, distinguished by its acute or acuminate leaves, occurs in the south and south west of the peninsula and outside Arabia extends into tropical NE Africa; and subsp. *virgata*, which has broader, rounded leaves, and is found in the extreme NW of Saudi Arabia, and outside Arabia occurs in Iran, Afghanistan, Pakistan and NW India. Subsp. *virgata* is apparently indistinguishable from *F. pseudosycomorus*, a species from Sinai, Palestine and Jordan.

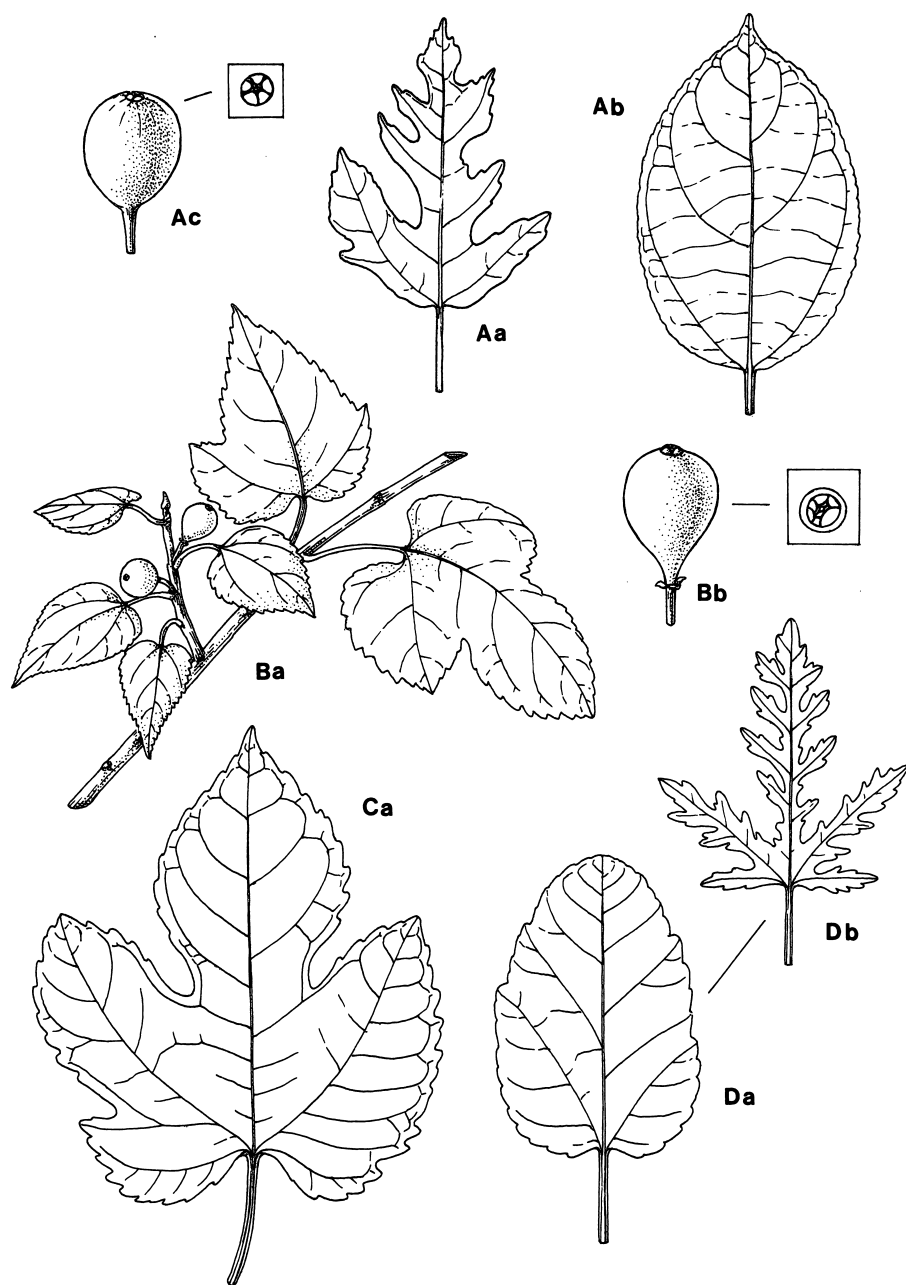


Fig. 14. Moraceae. A, *Ficus exasperata*: Aa, juvenile leaf ($\times 0.5$); Ab, adult leaf ($\times 0.5$); Ac, fig and ostiole ($\times 1$). B, *Ficus palmata*: Ba, fruiting branch ($\times 0.5$); Bb, fig and ostiole ($\times 1$). C, *F. carica*: Ca, leaf ($\times 0.5$). D, *F. johannis*: Da–Db, entire and dissected leaves ($\times 1$).

F. pseudosycomorus has, in this account, been provisionally placed in the synonymy of *F. palmata* subsp. *virgata*.

There are a number of problematic specimens. Certain forms of *F. palmata*, with large, deeply-lobed leaves, can sometimes be difficult to distinguish from *F. carica* and several gatherings (e.g. *Collenette* 4566; *Fayed* 1209; *Grainger* 531) appear to be somewhat intermediate between *F. palmata* and *F. carica* in leaf size and shape but are apparently wild and have been provisionally treated here as *F. palmata*. A cultivated specimen from Oman (*Western* 1191), which has large, unlobed leaves with deeply cordate bases, may represent an introduction of *F. carica* subsp. *rupestris* (Hauskn. ex Boiss.) Browicz.

1. Leaves simple or lobed, ovate in outline, the tip acute or acuminate
subsp. **palmata**
- + Leaves simple, rarely shallowly lobed, broadly ovate or suborbicular in
outline, the tip rounded or obtuse to shortly acute subsp. **virgata**

subsp. **palmata**. Syn.: *F. morifolia* Forsskal (1775 p.179); *F. forskalei* Vahl, Enum. pl. 2: 196 (1805). Illustr.: Fl. Ethiopia 3: 282 (1989); *Collenette* (1985 p.368) as *F. carica*. Type: Yemen (N), *Forsskal* (C). **Map 91, Fig. 14.**

Terrace-walls, cliffs and rocky slopes; 150–2700m.

Saudi Arabia, Yemen (N & S), Oman. NE tropical Africa.

subsp. **virgata** (Roxb.) Browicz in Fl. Iranica 153: 12 (1982). Syn.: ?*F. pseudosycomorus* Decne in Ann. Sci. Nat. Bot. Sér. 2 (2): 242 (1834). Illustr.: Fl. Iranica 153: t.6 (1982); *Collenette* (1985 p.368) as *F. carica* forma; Fl. Palaest. 1: t.34 (1966). **Map 92, Fig. 14.**

In drifted sand against cliffs and in narrow ravines; 950–2350m.

Saudi Arabia. Sinai, Palestine and Jordan; Iran, Afghanistan, Pakistan and NW India.

3. *F. johannis* Boiss., Diagn. pl. orient. sér 1, 1 (7): 96 (1846). Syn.: *F. carica* sensu *Western* (1989) non L.; *F. geraniifolia* Miq. in Hook., J. Bot. 7: 255 (1848). Illustr.: *Western* (1989 p.31) as *F. carica*; Fl. Iranica 153: t.5 (1982).

Shrub or small tree up to 8m. Sap milky. Leaves 3–5-lobed, rarely simple, sometimes highly dissected with \pm linear lobes, ovate in outline, 1–7 \times 1–7cm, truncate or cordate at the base, scabrous or smooth; lobes acute, obtuse or rounded, serrate or sinuately lobed; petioles 3–30mm. Figs 1–2 in the leaf axils, obovoid, 1–2cm diam., green ripening purple; peduncles 5–20mm, bearing a whorl of 3–4 bracts. Ostiole round, the ostiolar bracts visible. **Map 93, Fig. 14.**

Rocky slopes, cliffs, ravines, walls, rocky wadi-beds and field margins; 100–2500m.

Oman, UAE. Iran, Afghanistan, Pakistan and adjacent regions of C Asia.

F. johannis shows considerable variation in leaf shape, often with deeply dissected and more or less entire leaves on the same plant. It is frequently heavily grazed. A

note on a herbarium specimen from Oman (*Whitcombe* 422) records that the sap is supposed to cause an allergic skin reaction. Arabian material is all referable to subspecies *johannis*.

4. *F. exasperata* Vahl, Enum. pl. 2: 197 (1805). Syn.: *F. serrata* Forsskal (1775 p.179). Illustr.: Fl. Ethiopia 3: 284 (1989).

Shrub or tree up to 25m. Sap watery. Leaves entire or the juvenile foliage 3–5-lobed, ovate to elliptic or obovate in outline, 5–27 × 4–18cm, acute or obtuse to shortly acuminate, entire or repand to subserrate, rounded to cuneate or subcordate at the base, scabrous; petiole 0.5–4cm. Stipules amplexicaul, caducous. Figs 1–2 in the leaf axils, globose to obovoid, 1–1.5cm diam., scabrous, yellow, orange or red; peduncle 0.5–1(–1.5)cm; bracts scattered on the peduncles and the surface of the fig. Ostiole round, the ostiolar bracts visible. **Map 94, Fig. 14.**

Riverine woodland and deciduous shrubland; 650–1700m.

Yemen (N). Tropical Africa, S India and Sri Lanka.

5. *F. sycomorus* L., Sp. pl.: 1059 (1753). Syn.: *F. chanas* Forsskal (1775 p.219). Illustr.: Collette (1985 p.370).

Tree up to 20m. Sap milky. Twigs and petioles minutely puberulous and also with long straight hairs. Leaves simple, ovate to subcircular or rarely lobed (see note below), 3–14 × 2.5–11cm, rounded to obtuse, entire or repand, cordate to rounded at the base, scabrous or smooth above, pubescent to glabrescent beneath; petioles 0.5–7cm. Stipules amplexicaul, free, caducous. Figs on leafless branchlets borne on the trunk and larger branches, obovoid to subglobose, (1.5–)2–3cm diam., puberulous to tomentose, yellowish to reddish when ripe; peduncles 0.5–2.5cm, bearing 3 basal bracts. Ostiole rounded, with several ostiolar bracts visible. **Map 95, Fig. 15.**

Cliffs and rocky slopes, often near water; 100–1800m.

Saudi Arabia, Yemen (N & S), Oman. Tropical and southern Africa to Egypt and Syria.

A specimen from Oman (*Radcliffe-Smith* 5330) is unusual in having lobed leaves (resembling those of *F. palmata*) on the sucker-shoots.

6. *F. sur* Forsskal (1775 p.180). Syn.: *Sycomorus sur* (Forsskal) Miq. in Verh. Kon. Akad. Wet. Amster. Nat., ser. 3 (1): 121 (1849); *Ficus capensis* Thunb., Ficus: 13 (1786). Illustr.: Fl. Ethiopia 3: 288 (1989); Fl. Trop. E. Afr.: 57 (1989). Type: Yemen (N), *Forsskal* (C).

Tree up to 20m. Sap milky. Twigs and petioles puberulous, tomentose or hirsute. Leaves ovate to elliptic or lanceolate, 4–22 × 3–9cm, acute to acuminate, entire or repand, rounded to cordate at the base, glabrous above, sparsely puberulous or glabrous beneath; petioles 1–8cm. Stipules amplexicaul, free, caducous. Figs on leafless branchlets borne on the trunk and larger branches, obovoid to subglobose, 2–4cm diam., glabrous to densely tomentose, orange-grey when ripe; peduncles 0.5–

2cm, bearing a whorl of 3 basal bracts. Ostiole rounded, with several ostiolar bracts clearly visible. **Map 96, Fig. 15.**

Riverine woodland and fields margins; 300–2700(–3000)m.

Yemen (N). Tropical and southern Africa.

7. *F. cordata* Thunb. subsp. ***salicifolia*** (Vahl) C.C. Berg in Kew Bull. 43: 82 (1988). Syn.: *F. ambiguum* Forsskal (1775 p.219); *F. indica* sensu Forsskal non L.; *F. salicifolia* Vahl (1790 p.82 t.23). Illustr.: Fl. Ethiopia 3: 290 (1989); Collenette (1985 p.369); Western (1989 p.31) all as *F. salicifolia*. Type: Yemen (N), *Forsskal* 780 (C).

Shrub or small tree up to 8m. Sap milky. Leaves lanceolate, 2–16(–27) × 1–3(–6)cm, acute to acuminate, entire, rounded or slightly cordate at the base, glabrous; petioles 1–5cm. Stipules fully amplexicaul, free. Figs 1–3 in the leaf axils, globose, 7–10mm diam., glabrous to puberulous, white to purplish when ripe, sessile or pedunculate; peduncles up to 4mm, bearing 3 basal bracts. Ostiole circular, with 3 bracts visible. **Map 97, Fig. 15.**

Rocks and cliffs, often near water; 0–2500m.

Saudi Arabia, Yemen (N & S), Socotra, Oman, UAE. Distributed throughout Africa.

8. *F. ingens* (Miq.) Miq. in Ann. Mus. Bot. Lugduno-Batavum 3: 288 (1867). Syn.: *F. ingentoides* Hutch. in Bull. Misc. Inform 1915: 319 (1915); *F. lutea* sensu Miller & Morris (1988) and Schwartz (1939) non Vahl. Illustr.: Fl. Trop. E. Afr.: 62 (1989); Fl. Ethiopia 3: 291 (1989); Collenette (1985 p.369).

Shrub or small tree up to 10m. Sap milky. Leaves narrowly ovate to oblong-lanceolate, 7–22 × 4–10cm, acute to acuminate, entire, cordate or rounded at the base, glabrous; petioles 1–5cm; stipules fully amplexicaul, free, caducous. Figs 1–2 in the leaf axils, globose, 10–15mm diam., glabrous to tomentose, white to pink when ripe, sessile or pedunculate; peduncles up to 4mm, bearing 3 basal bracts. Ostiole circular, with 3 bracts visible. **Map 98, Fig. 15.**

Boulders, cliffs and rocky slopes, in drought-deciduous woodland; (20–)150–2300m.

Saudi Arabia, Yemen (N & S), Oman. Tropical and southern Africa.

9. *F. glumosa* Del., Voy. Méroé: 63 (1826). Syn.: *F. glumosa* Del. var. *glaberrima* Martelli, Fl. bogos.: 76 (1886). Illustr.: Fl. Ethiopia 3: 293 (1989); Collenette (1985 p.368).

Shrub or tree up to 30m, starting as an epiphyte or on rocks. Sap milky. Leaves oblong-elliptic or oblong-obovate, 5–15 × 3–8cm, rounded or shortly acuminate, entire, cordate or rounded at the base, glabrous or thinly pubescent above, glabrescent to densely pubescent beneath; petioles 2–4cm. Stipules fully amplexicaul. Figs 1–2 in the leaf axils, globose, 6–7(–10)mm diam., glabrous to densely tomentose, pink or red when ripe; peduncles up to 3mm, bearing 2(–3) basal bracts. Ostiole slit-shaped, 2-lipped, with no bracts visible. **Map 99, Fig. 16.**

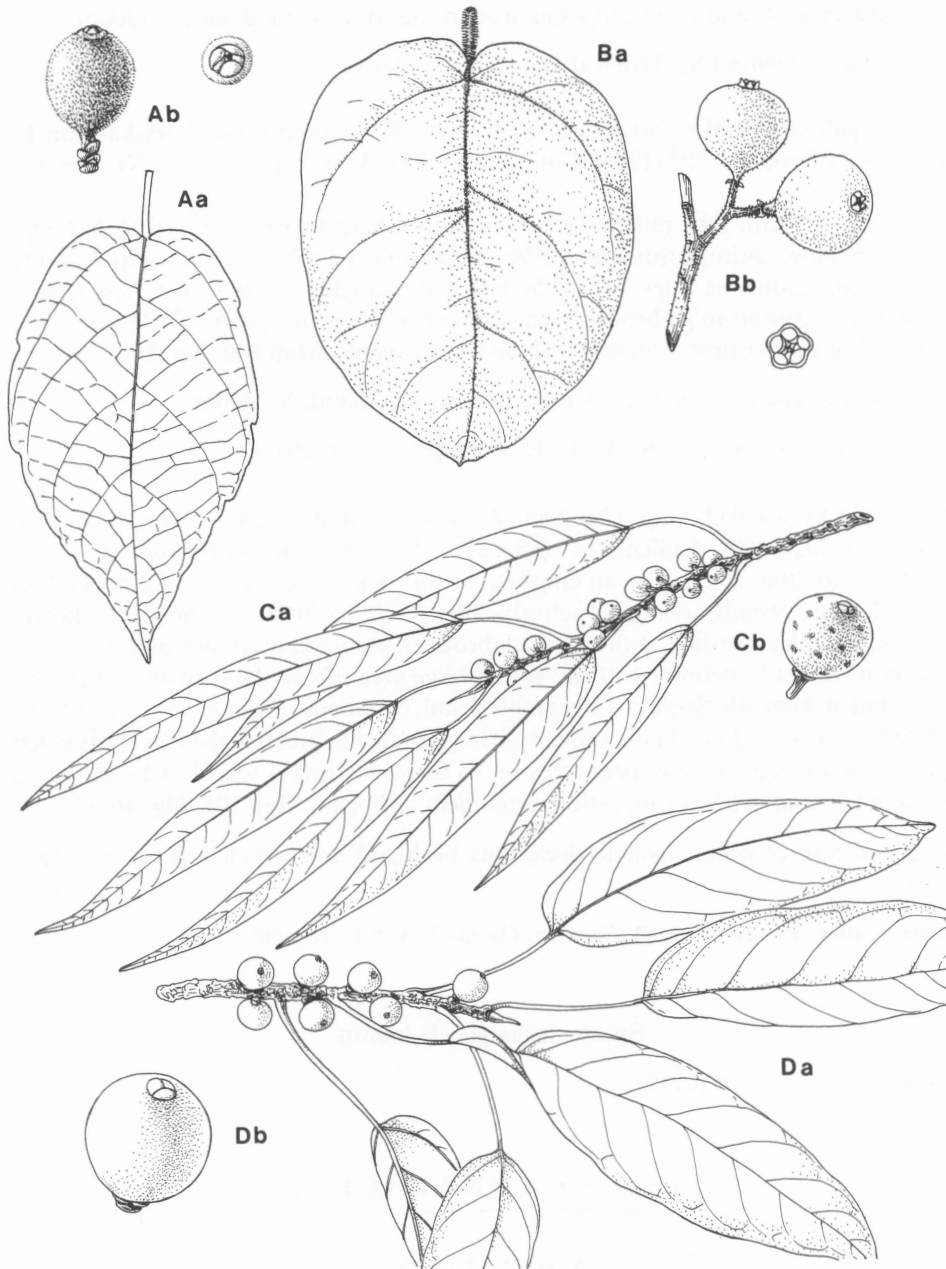


Fig. 15: Moraceae. A, *Ficus sur*: Aa, leaf ($\times 0.6$); Ab, fig and ostiole ($\times 1.5$). B, *F. sycomorus*: Ba, leaf ($\times 0.6$); Bb, figs and ostiole ($\times 0.6$). C, *F. cordata* subsp. *salicifolia*: Ca, fruiting branch ($\times 0.6$); Cb, fig ($\times 1.5$). D, *F. ingens*: Da, fruiting branch ($\times 0.6$); Db, fig ($\times 1.5$).

MORACEAE

On boulders, cliffs and rocky slopes in drought-deciduous woodland; 5–1300m.

Saudi Arabia, Yemen (N). Tropical and southern Africa.

10. *F. populifolia* Vahl (1790 p.82 & t.22). Syn.: *F. religiosa* sensu Forsskal non L. Illustr.: Fl. Ethiopia 3: 295 (1989); Collenette (1985 p.369). Type: Yemen (N), *Forsskal* (C).

Tree up to 12m. Sap milky. Leaves broadly ovate to cordate, 5–20 × 5–16cm, long acuminate, entire, cordate at the base, glabrous; petioles 5–14cm. Stipules fully amplexicaul, caducous. Figs 1–2 in the leaf axils, subglobose, 0.5–1(–1.5)cm diam., minutely puberulous to glabrous, green with red spots when ripe; peduncles 0.5–2cm, bearing 2 bracts. Ostiole 3-lipped, with no bracts visible. **Map 100, Fig. 16.**

Rocky slopes and ravines in drought-deciduous woodland; 5–2400m.

Saudi Arabia, Yemen (N & S). W, C, E, and NE tropical Africa.

11. *F. vasta* Forsskal (1775 p. 179). Syn.: *F. socotrana* Balf. f. (1883 p.96). Illustr.: Fl. Ethiopia 3: 297 (1989); Collenette (1985 p.370). Type: Yemen (N) *Forsskal* (C).

Tree up to 20m, starting as an epiphyte or on rocks, often with aerial roots. Sap milky. Leaves broadly ovate to suborbicular, 7–30 × 6–20cm, rounded or shortly acuminate, entire, cordate at the base, glabrous to glabrescent above, glabrescent to velutinous beneath; petioles 4–10cm, with a large area of glandular tissue at the base of the midrib beneath. Stipules fully amplexicaul, caducous. Figs 1–2 in the leaf axils, subglobose, 1–1.5(–2)cm diam., tomentose to glabrescent, green with paler spots when ripe; sessile or pedunculate; peduncles up to 6mm, bearing a whorl of basal bracts which fall leaving a hairy rim; ostiole prominent, 2-lipped. **Map 101, Fig. 16.**

Cliffs and terrace-walls; drought-deciduous bushland and wooded grassland; 350–2300m.

Saudi Arabia, Yemen (N & S), Socotra, Oman. E & NE tropical Africa.

Species incompletely known

F. taab Forsskal (1775 p.219).

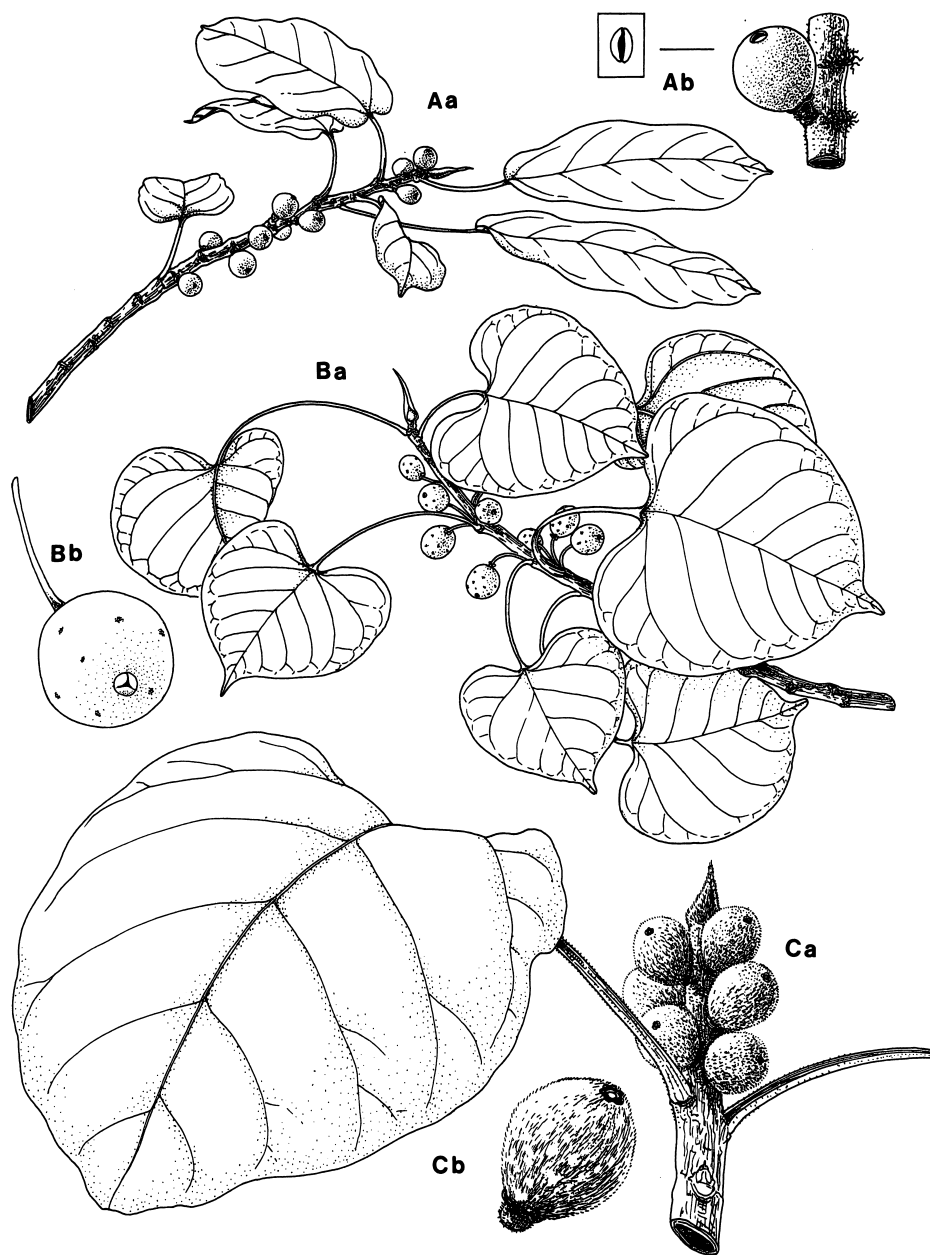
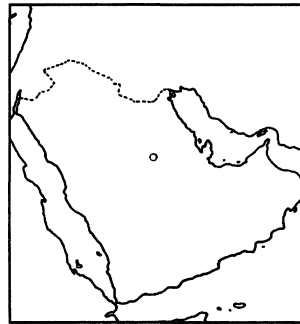
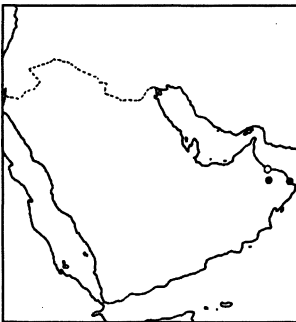


Fig. 16. Moraceae. A, *Ficus glumosa*: Aa, fruiting branch ($\times 0.6$); Ab, fig and ostiole ($\times 2$). B, *F. populifolia*: Ba, fruiting branch ($\times 0.6$); Bb, fig ($\times 2$). C, *F. vasta*: Ca, leaf and figs ($\times 0.6$); Cb, fig ($\times 1.25$).

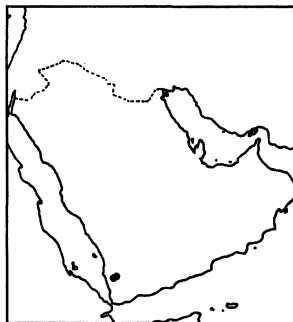
Distribution Maps



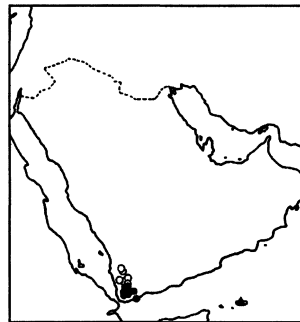
Map 84. *Morus nigra*



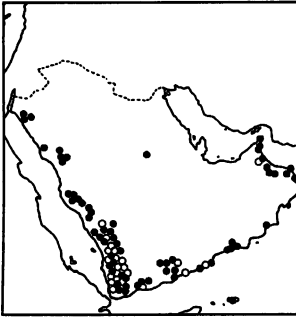
Map 85. *M. alba*



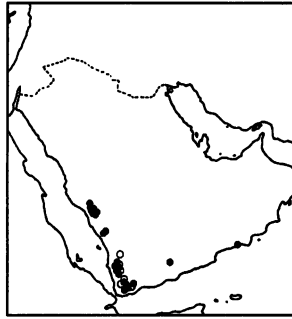
Map 86. *Antiaris toxicaria*



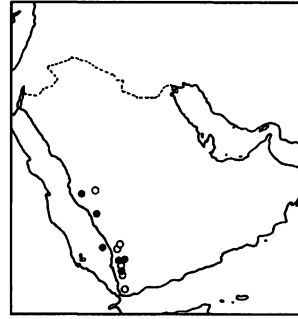
Map 87. *Dorstenia barnimiana* ●
D. socotrana ▲



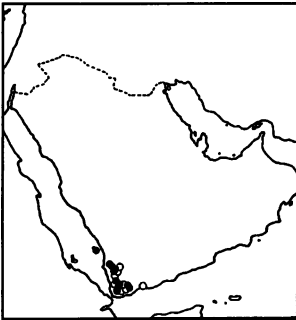
Map 97. *F. cordata* subsp. *salicifolia*



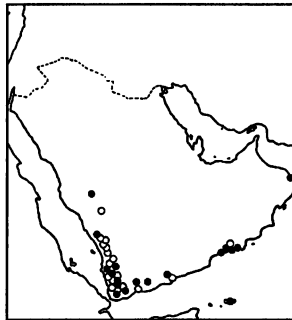
Map 98. *F. ingens*



Map 99. *F. glumosa*



Map 100. *F. populifolia*



Map 101. *F. vasta*