

Family 44. RANUNCULACEAE

A.G. MILLER & J.A. NYBERG

Annual or perennial herbs, rarely woody climbers (*Clematis*). Leaves alternate or rarely opposite (*Clematis*), usually deeply divided or compound; stipules minute or absent. Flowers actinomorphic or zygomorphic, solitary, racemose or paniculate. Perianths uniseriate or biseriate. Sepals 3–5(–8), free, often petaloid. Petals 5–8, rarely more, sometimes absent, free or united, often nectar-secreting. Stamens numerous, spirally arranged. Carpels numerous, rarely 1–5, free or rarely fused; ovules 1–numerous, marginal. Fruit a cluster of achenes or follicles.

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|---|----------------------|
| 1. Woody climbers; leaves opposite | 1. Clematis |
| + Annual or perennial herbs, never climbing; leaves alternate | 2 |
| 2. Flowers zygomorphic, spurred | 6. Delphinium |
| + Flowers actinomorphic, without spurs | 3 |
| 3. Fruit a group of several fused follicles; petals 2-lobed | 5. Nigella |
| + Fruit a group of free achenes; petals absent or entire | 4 |
| 4. Petals absent; sepals 4, often petaloid; perennial herb up to 1m | 2. Thalictrum |
| + Petals present; sepals 5; annual or perennial herbs up to 50cm | 5 |

- 5. Petals without a basal nectary pouch; leaves pinnatisectly divided into linear segments; never aquatic **3. Adonis**
- + Petals with a basal nectary pouch; leaves palmately divided, if with linear segments then a submerged aquatic **4. Ranunculus**

1. CLEMATIS L.

Woody climbers. Leaves opposite, pinnately or bi-pinnately divided, the leaflets petiolulate. Flowers actinomorphic, solitary or in few- to many-flowered panicles. Sepals 4, sometimes petaloid. Petals absent. Carpels many, usually uniovulate. Fruit a cluster of achenes bearing persistent plumose styles.

- 1. Leaves bipinnate, usually with more than 10 leaflets **4. C. orientalis**
- + Leaves pinnate with 3–7 leaflets 2
- 2. Leaves rusty-tomentose beneath; lateral leaflets asymmetric; sepals 3.5–5cm, erect at anthesis **3. C. longicauda**
- + Leaves sometimes tomentose but never rust-coloured beneath; lateral leaflets symmetric; sepals 0.8–15(–30)mm, spreading at anthesis 3
- 3. Leaflets often trilobed, the margins crenate-serrate to the base and the tip, tomentose or rarely thinly pubescent beneath **1. C. hirsuta**
- + Leaflets simple, the margins crenate-serrate at the middle but entire at the tip and base, glabrous or thinly pubescent beneath **2. C. simensis**

1. C. hirsuta Guillemin & Perr., Fl. Seneg. tent. 1: 1 (1831). Syn.: *C. incisodentata* A. Rich. (1847–8 p. 2); *C. wightiana* Wallich, Numer. List n.4674 (1831). Illustr.: Collette (1985 p.416) as *C. incisodentata*.

Stems up to 4m. Leaves with 3, 5 or 7 leaflets; leaflets often 3-lobed, ovate to broadly ovate, 3–9 × 2–8cm, the margin crenate-serrate, sparsely pubescent or glabrous above, tomentose or more rarely thinly pubescent beneath. Inflorescence many-flowered. Sepals white or cream, c.8–15(–30) × 5–6mm, tomentose. Achenes ellipsoid, 2.5–3.5 × 2–2.5mm, the persistent style 2–3.5cm. **Map 415, Fig. 58.**

On terrace-walls and hedges, in bushland by water-courses; 700–2000(–2900)m.

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

2. C. simensis Fresen., Beitr. Fl. Abyssin. 2: 267 (1837). Illustr.: Collette (1985 p.416).

Stems up to 2(–10)m. Leaves with 5 or sometimes 3 leaflets; leaflets simple, ovate, 4.5–12 × 2.5–5.5cm, tip acuminate, the margin crenate-serrate at the middle and entire at the base and tip, glabrescent or sometimes pubescent beneath. Inflorescence many-flowered. Sepals white or cream, c.8–10 × 3–5mm, tomentose. Achenes ellipsoid, c.3 × 2.5mm, the persistent style up to 4cm. **Map 416, Fig. 58.**

On terrace walls and hedges, in bushland by watercourses; 1700–1900m.

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

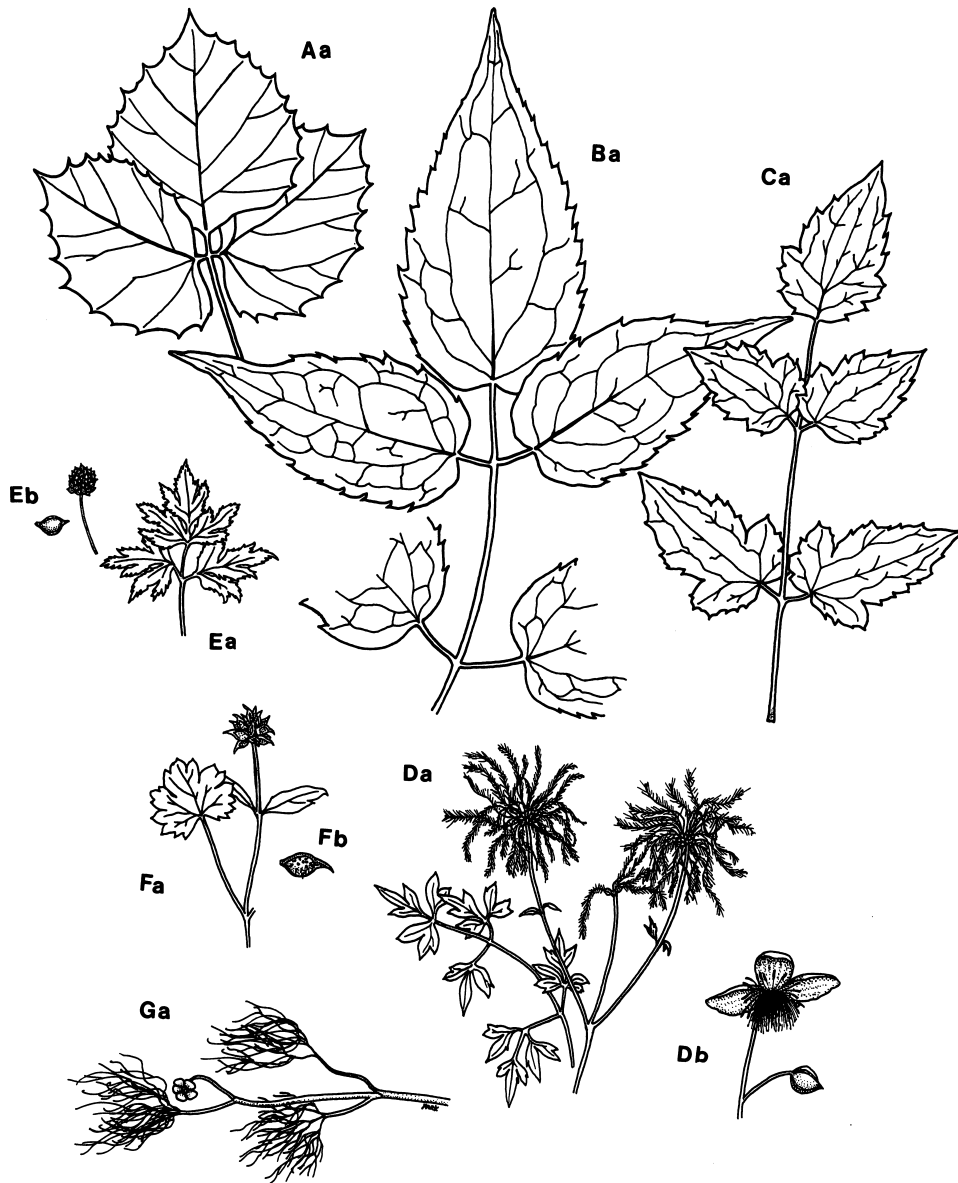


Fig. 58. Ranunculaceae. A, *Clematis longicauda*: Aa, leaf. B, *C. simensis*: Ba, leaf. C, *C. hirsuta*: Ca, leaf. D, *C. orientalis*: Da, leaf and fruits; Db, flower and bud. E, *Ranunculus multifidus*: Ea, leaf; Eb, fruiting head and achene. F, *R. muricatus*: Fa, leaf and fruiting head; Fb, achene. G, *R. rionii*: Ga, flowering shoot. All $\times 0.4$ except achenes $\times 3$.

3. *C. longicauda* Steud. ex A. Rich. (1847 p.2).

Stems up to 8m. Leaves with 3, rarely 5 leaflets; leaflets simple or sometimes 3-lobed, ovate to transversely ovate, 4–9 × 3.5–7cm, the lateral leaflets asymmetric, the margin dentate, glabrescent above rusty-tomentose beneath. Inflorescence few-flowered. Sepals yellowish brown, 3–5 × 1.5cm, tomentose. Achenes ellipsoid, c.4 × 2mm, the persistent style up to 7.5cm. **Map 417, Fig. 58.**

1950m.

Yemen (N). Ethiopia

Known only from a single sterile specimen (J. Nasira near Hajjah, *Müller-Hohenstein & Deil* 701). Flowering material is required so that its presence in Arabia can be confirmed. The fruiting and flowering measurements given above are taken from Ethiopian plants.

4. *C. orientalis* L., Sp. pl.: 543 (1753).

Stems up to 6m. Leaves bipinnate with more than 10 leaflets; leaflets lanceolate, 15–35 × 5–10mm, entire or with 1–2 teeth, glabrescent. Flowers solitary or in few-flowered panicles. Sepals yellowish, 6–18 × 4–10mm. Achenes ellipsoid, 3–3.5 × 2–2.5mm, the persistent style 3–3.5cm. **Map 418, Fig. 58.**

Scrambling over rocks in *Juniperus* woodland and by villages; 1900–3000m.

Oman. SE Europe, SW Asia, NW India and C Asia.

A very variable and widespread species in the Middle East. The Arabian plants differ from plants elsewhere in the range of the species by their more divided leaflets.

2. THALICTRUM L.

Perennial herbs. Leaves alternate, pinnately divided, the bases sheathing, the leaflets petiolulate. Flowers actinomorphic, small, in panicles. Sepals 4, usually soon deciduous. Petals absent. Carpels numerous, uniovulate. Fruit a cluster of free achenes, with short persistent styles.

1. *T. minus* L., Sp. pl.: 546 (1753).

Glabrous or glandular-hairy herb; stems erect, up to 1m. Leaves triangular in outline, up to 30cm long; ultimate segments oblong to obtriangular, 3–7-lobed or toothed, glabrous or sparsely glandular-pubescent beneath. Flowers in lax panicles. Sepals greenish yellow, c.4mm. Stamens c.7mm. Achenes sessile, ellipsoid, ribbed, c.3mm long, glabrous or sparsely glandular. **Map 419, Fig. 59.**

Cliffs and rocky gullies; 1600–3000m.

Yemen (N & S). Europe, NW Africa, Ethiopia, South Africa, SW Asia and Siberia.



Fig. 59. Ranunculaceae. A, *Thalictrum minus*: Aa, leaf ($\times 1$); Ab, infructescence ($\times 1$); Ac, flower ($\times 4$); Ad, fruit ($\times 10$). B, *Adonis dentata*: Ba, flowering and fruiting shoot ($\times 1$); Bb, flower ($\times 3$). C, *Delphinium sheilae*: Ca, flower ($\times 3$). **Berberidaceae.** D, *Berberis hostii*: Da, fruiting branch ($\times 1$); Db, sterile branch ($\times 1$).

3. ADONIS L.

Annual or perennial herbs. Leaves alternate, 2–3-pinnate with linear segments. Flowers actinomorphic, solitary at the ends of branches. Sepals 5, membranous. Petals 5–20, showy. Carpels numerous, uniovulate. Fruit an elongated head of beaked achenes.

1. **A. dentata** Del. (1813 p.143). Illustr.: Collenette (1985 p.415).

Glabrous annual herb; stems erect, up to 20cm. Leaf-segments linear. Sepals 3–5mm. Petals orange or yellow, 5–10 × 3–5mm. Anthers violet-black. Fruiting head up to 1.5cm long; achenes wrinkled, c.2 × 1mm. **Map 420, Fig. 59.**

Sandy and gravelly plains; 885m.

Saudi Arabia, Yemen (N), Kuwait. Cyprus, N Africa and SW Asia.

4. RANUNCULUS L.

Terrestrial or aquatic, annual or perennial herbs. Leaves alternate, simple or compound, with or without stipules. Flowers actinomorphic, solitary or in panicles. Sepals 5 (in Arabia). Petals yellow or white, 5 or more, bearing a basal nectary pit which is often covered by a scale. Carpels few to many, uniovulate. Fruit a group of free, beaked achenes.

- 1. Aquatic plants; leaves submerged and divided into linear segments; petals white with a yellow base 2
- + Terrestrial plants; leaves with broad laminas; petals yellow 3
- 2. Fruiting peduncle shorter than the subtending leaf; petals 3–5mm long 4. **R. rionii**
- + Fruiting peduncle longer than the subtending leaf; petals 6–10mm long 5. **R. sphaerospermus**
- 3. Perennial; achenes 1.5–2mm long, including the beak 3. **R. multifidus**
- + Annuals; achenes 4–8mm long, including the beak 4
- 4. Fruiting peduncle equalling or shorter than the subtending leaf; lower leaves suborbicular to broadly ovate, entire and crenate-dentate or 3-lobed into broad segments 1. **R. muricatus**
- + Fruiting peduncle much longer than the subtending leaf; lower leaves ovate, 3-lobed, the lobes themselves divided into narrow segments 2. **R. cornutus**

Subgenus **Ranunculus**

Terrestrial herbs with leaves various but never submerged and divided into linear segments; petals yellow or red; achenes smooth, sculptured or tuberculate, rarely transversely ridged, usually distinctly beaked.

1. **R. muricatus** L., Sp. pl.: 555 (1753). Illustr.: Collenette (1985 p.417); Mandaville (1990 pl. 11).

Terrestrial annual herb, 5–30cm, glabrous or sparsely pilose. Lower leaves simple or 3-lobed, subcircular to transversely ovate, $0.5\text{--}7.5 \times 0.5\text{--}10\text{cm}$, the margin coarsely crenate-dentate, the base cordate or truncate; petiole 1–13cm; upper leaves with narrower segments and more shortly petiolate. Flowers on a peduncle which is equal to or shorter than the subtending leaf. Sepals 5, reflexed. Petals yellow, 3–6(–9)mm. Achenes narrowly elliptic, $6\text{--}8 \times 3\text{--}4\text{mm}$, compressed, faces bearing short spines, margin grooved, with a hooked beak at the tip. **Map 421, Fig. 58.**

Weed of irrigated areas; 300–2000m.

Saudi Arabia, Oman, UAE. S Europe, SW Asia, N Africa.

2. *R. cornutus* DC., Syst. nat. 1: 300 (1817).

Similar to *R. muricatus* but the lower leaves ovate, 3-lobed with the lobes themselves divided into narrow segments; peduncles much exceeding the subtending leaves. **Map 422.**

Weed of irrigated areas; 10–100m.

Saudi Arabia. SE Europe and SW Asia.

A rare weed of oases in E Saudi Arabia.

3. *R. multifidus* Forsskal (1775 p.102). Syn.: *R. forskoehlii* DC., Syst. nat. 1: 303 (1817). Illustr.: Collenette (1985 p.417) Type: Yemen (N), *Forsskal* (C).

Terrestrial perennial herb, 10–50cm, pilose. Leaves triangular, deeply pinnately-dissected into lanceolate segments, $3\text{--}9 \times 4\text{--}10\text{cm}$, the segments serrate; petioles 1–10cm. Sepals 5, reflexed. Petals yellow, 3–7mm. Achenes obovate, $c.1.5 \times 1.5\text{--}2\text{mm}$, compressed, faces smooth or with scattered tubercles, with a hooked beak at the tip. **Map 423, Fig. 58.**

Wet and irrigated areas, 1800–2800m.

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

Subgenus *Batrachium* (DC.) A. Gray

Aquatic herbs with submerged leaves finely dissected into linear segments; petals white with a yellow base; achenes transversely ridged with a short beak.

4. *R. rionii* Lager in Flora 31: 49 (1848). Syn.: *R. trichophyllus* Chaix var. *rionii* (Lager) Rikli in Schinz & R. Keller, Fl. Schweiz: 193 (1900).

Aquatic, annual or perennial herb, glabrous or sparsely pilose. Leaves all submerged, up to 6cm long, subsessile or shortly petiolate, finely divided into linear segments. Fruiting peduncle shorter than the subtending leaf. Sepals 5. Petals white with a yellow base, 3–5mm. Achenes elliptic, 0.75–1mm, somewhat compressed, faces wrinkled, shortly beaked at the tip. **Map 424, Fig. 58.**

Submerged in pools and slow-running water; 2100–2900m.

Saudi Arabia, Yemen (N). N Temperate regions, SW Asia and southern Africa.

Literature records (e.g. Schwartz p.59) of *R. aquatilis* L. from Arabia are probably referable to this species. *R. aquatilis* differs in its larger achenes (1.5–2mm) and petals (up to 10mm).

5. *R. sphaerospermus* Boiss. & Blanche, Diagn. pl. orient. sér. 2, (3)5: 6 (1856). Illustr.: Collenette (1985 p.417) as *R. trichophyllus*.

Similar to *R. rionii* but differing in the fruiting peduncles exceeding the subtending leaves in fruit and the longer (6–10mm) petals. **Map 425.**

Pools in slow-running water; 2550–2900m.

Saudi Arabia. SE Europe, SW Asia and the Himalayas.

Known only from two pools in the Asir mountains of Saudi Arabia. The determination of the Arabian material as *R. sphaerospermus* is provisional and therefore the presence of this species in Arabia requires confirmation. The material examined (Collenette 1170 and 4669) has the relatively long petals and elongating peduncles which distinguish it from the related species, *R. rionii* and *R. trichophyllus*. However, in the Arabian material the achenes are c.1.5mm long, whereas in non-Arabian material they are usually less than 1mm. The species of subgenus *Batrachium* are notoriously difficult and further collecting in Arabia is needed.

5. NIGELLA L.

Annual herbs. Leaves alternate, 1–3-pinnatisect into \pm linear segments. Flowers solitary at the ends of branches. Sepals 5, petaloid (in Arabia). Petals 5(–8), nectariferous, with a bent claw and two lobes, the inner lobe simple, the outer lobe bifid. Stamens numerous. Carpels 2–10, free or partly fused. Fruit of several follicles, many-seeded, free or partly fused to form a capsule and crowned by the persistent styles.

1. *N. sativa* L., Sp. pl.: 534 (1753).

Erect herb up to 50cm, pubescent or glandular-hirsute. Leaf-segments linear-lanceolate. Sepals whitish, petaloid, ovate, c.7–14 \times 6–8mm, shortly clawed. Petals much smaller than the sepals. Anthers mucronate. Follicles united to the apex. **Map 426.**

Cultivated in the highlands; 300–2300m.

Saudi Arabia, Yemen (N & S). Native of SW Asia, widely cultivated elsewhere for its seeds. SW Asia, N Africa and S Europe.

Cultivated as a culinary herb and for medicinal purposes. Records of *N. arvensis* L. (distinguished by the follicles which are free at the apices) probably refer to this species.

6. DELPHINIUM L.

(including *Consolida* (DC.) S.F. Gray)

Annual or perennial herbs. Leaves alternate, palmately divided or laciniate. Flowers zygomorphic, in racemes. Sepals 5, petaloid, the 2 uppermost fused towards the base and forming a spur. Petals 4, free or united, the uppermost produced into a nectar-secreting spur within the sepal spur. Stamens numerous. Ovary of 1–9 carpels. Fruit of 1–5 free or partly fused follicles.

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|----|---|---------------------------|
| 1. | Flowers violet; petals united into a 3-lobed limb; follicles solitary | |
| | | 3. D. orientale |
| + | Flowers bright blue or pale blue suffused with purple; petals free; follicles 2–5 | 2 |
| 2. | Annual; stems retrorsely pubescent at the base | 1. D. sheilae |
| + | Perennial; stems viscid-pubescent throughout | 2. D. penicillatum |

Subgenus **Delphinium**

Annual or perennial. Petals free. Carpels 2–5.

1. D. sheilae Kit Tan in Notes Roy. Bot. Gard. Edinburgh 42: 17 (1984). Illustr.: Colletette (1985 p. 417). Type: Saudi Arabia, *Colletette* 4531 (E, K).

Annual; stem erect, up to 85cm, retrorsely pubescent at the base. Basal leaves soon withering, apparently up to c.8cm, long-petiolate, laciniate at the tip; cauline leaves entire or tripartite, oblanceolate to lanceolate, up to 4cm. Flowers in lax racemes, bright blue or pale blue flushed with purple, c.2cm long; spur 1.5cm long. Fruit glabrous, 6–7mm. **Map 427, Fig. 59.**

N facing cliffs on granite and on open basaltic hillsides; 1450–1600m.

Saudi Arabia. Endemic.

Known only from two gatherings in NW Saudi Arabia.

2. D. penicillatum Boiss. in Ann. Sci. Nat. Bot. sér. 2, 16: 369 (1841). Type: Oman, *Aucher-Eloy* 4034 (K, P)

Perennial; stem erect, up to 30cm, viscid-pubescent throughout. Leaves suborbicular; blade 1.5–2cm, tripartite; segments linear, bipinnatifid; petioles 3–6cm. Flowers in dense racemes, pale blue, c.1.5cm long; spur c.1cm long. **Map 428.**

Oman. Iran.

In Arabia known only from a single gathering made near Muscat in the last century, apparently now extinct there.

Subgenus **Consolida** (DC.) Huth.

Annual. Petals united into a 3–5-lobed or subentire limb. Carpel solitary.

3. *D. orientale* J. Gay in Des Moul., Cat. rais. pl. Dordogne: 12 (1839). Syn.: *D. ajacis* L., Sp. pl.: 531 (1753), nomen confusum; *Consolida orientalis* (J. Gay) Schröd. in Abhandl. Zool.-Bot. Ges. Wien 4(5): 62 (1909).

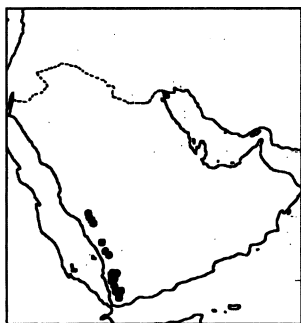
Annual; stem erect, up to 10(–70)cm, crisped-hairy, with glandular hairs above. Leaves pinnately ternate with linear segments. Flowers in dense racemes, violet, c.2cm; spur 5–10mm, shorter than the sepals; bracteoles reaching to at least the base of the flowers. Follicles pubescent. **Map 429.**

In thickets of *Ziziphus nummularia*.

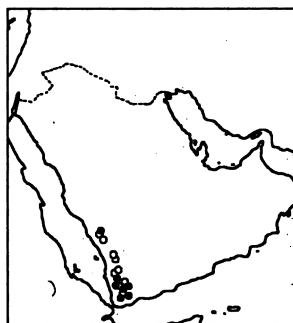
Saudi Arabia. N Africa, Mediterranean region, SW & C Asia.

In Arabia known only from a single gathering from C Saudi Arabia.

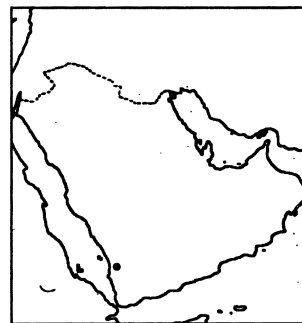
Distribution Maps



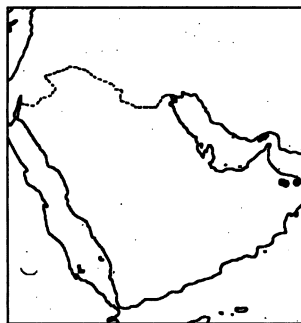
Map 415. *Clematis hirsuta*



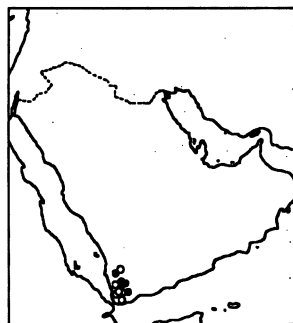
Map 416. *C. simensis*



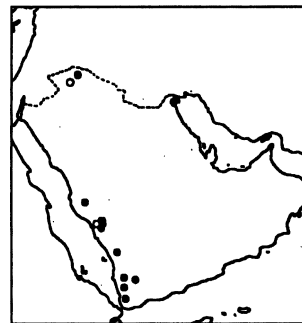
Map 417. *C. longicauda*



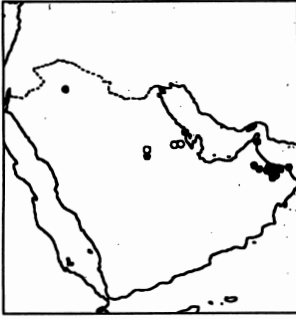
Map 418. *C. orientalis*



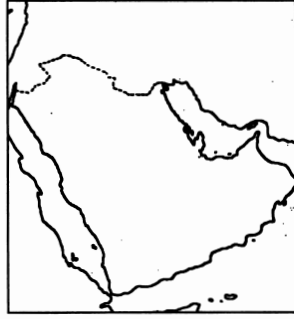
Map 419. *Thalictrum minus*



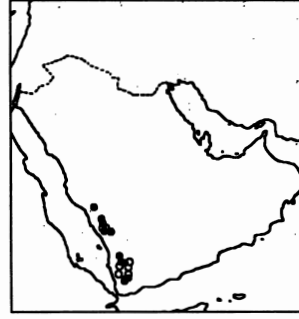
Map 420. *Adonis dentata*



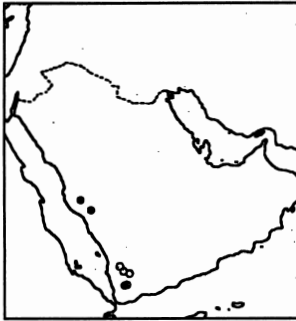
Map 421. *Ranunculus muricatus*



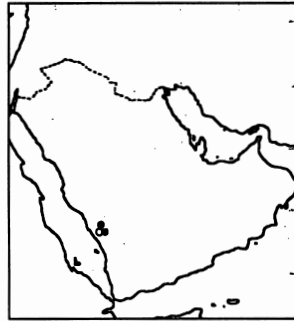
Map 422. *R. cornutus*



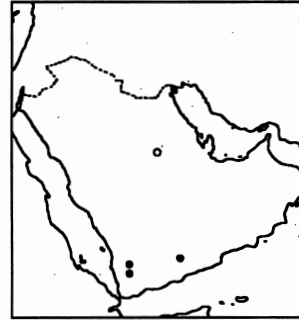
Map 423. *R. multifidus*



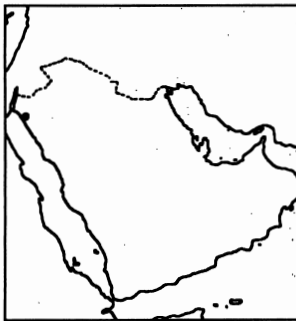
Map 424. *R. rionii*



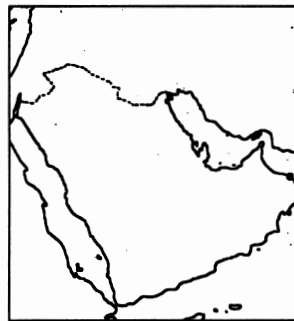
Map 425. *R. sphaerospermus*



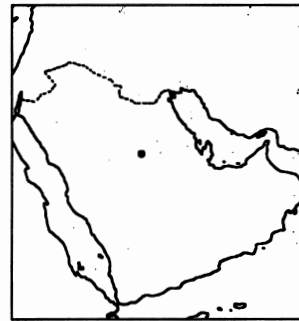
Map 426. *Nigella sativa*



Map 427. *Delphinium sheilae*



Map 428. *D. penicillatum*



Map 429. *D. orientale*