Annual, biennial, or perennial herbs, sometimes aquatic. Leaves opposite or alternate, simple, entire or variously lobed; stipules usually present or 0. Flowers bisexual, usually regular, mostly solitary and axillary, subtending leaves sometimes greatly reduced or 0. Sepals (2–)4–5–(7), lobes valvate, free floral tube present or 0. Petals as many as sepalas, or 0, caducous. Stamens as many or twice as many as sepalas; anthers oblong or linear, introrse, versatile. Ovary inferior, locules as many as sepalas, with 1 to many ovules in each loculus; style single, often thick; stigma entire or deeply lobed. Fruit a capsule or nut, often elongated. Seeds terete or prismatic-angled, smooth or papillate, with a terminal tuft of hairs in Epilobium. Ancestral basic chromosome number: x = 11.

Characters not applicable in southern Africa: some shrubs or trees; fruit a berry in Fuchsia, widely cultivated as an ornamental in southern Africa; flowers unisexual in some species of Fuchsia.

Genera 17, species ± 674, cosmopolitan in tropical and temperate areas, but mostly America. Two genera native in southern Africa, and two more introduced and naturalized. Unless stated otherwise, all cited type specimens were seen by one or both authors.

1a Floral tube 0; sepalas persistent in fruit after petals have fallen; petals lacking, or if present, yellow ........................................ Ludwigia
1b Floral tube present; sepalas not persistent in fruit, falling with floral tube; petals yellow, rose-purple, or white: 2a Flower zygomorphic, petals white; fruit nutlike, indehiscent: L. leptocarpa 4a Plants densely pubescent to subglabrous; capsules sub-terete, lateral veins on each side of midrib; pollen grains shed singly ........................................ 1. L. erecta
2b Flower actinomorphic, petals yellow, rose-purple, or white; fruit a dehiscent capsule, with many ovules: 3a Seeds with an evident coma (tuft of hairs); petals rose-purple or white; capsule slender, more than 10 x as long as broad; basal leaves opposite ...................... Epilobium
3b Seeds lacking a coma; petals yellow, rose-purple or white; capsule clavate or elongate, thicker, less then 10 x as long as broad; all leaves alternate .......... Onagahera

Note: Ludwigia perennis L. is treated as occurring in southern Africa in Raven (1963: 367) based on the single collection, Schlechter 12189, from Lions Creek. This locality has been found to be in southern Mozambique (Raven 1978: 339). L. polycarpa S. Short & Peter ex Torr. & Gray has possibly been introduced to southern Africa: Zambatis 1165 from Klaserie and Barrett 488a from Swaziland are housed at PRE. L. stenorrhaphe (Brenan) Harms subsp. macrocephala (Brenan) P.H. Raven has been collected in Botswana: Smith 1975 (SRGH, PRE).

Species ± 85 and sections 23, worldwide, mainly South America, relatively few in Africa; seven in southern Africa, widespread in subtropical parts, extending to southern Western Cape.

Ludwigia L., Species plantarum 118 (1753); Harv.: 504 (1862); P.H. Raven: 327 (1963); Schreiber: 1 (1967); R.Fern. & A.Fern.: 190 (1970); Ross: 262 (1972); R.A. Dyer: 409 (1975); P.H. Raven: 333 (1978). Type species L. perennis L.

Jussiaea L.: 388 (1753); Harv.: 504 (1862).

Annual or perennial herbs, or undershrubs, sometimes prostrate, often associated with water. Leaves alternate or opposite, simple, usually entire. Stipules present, often much reduced. Flowers actinomorphic, borne in axils of reduced upper leaves, their opening not highly synchronized. Sepals 3–7, persistent after petals have fallen. Floral tube 0. Petals as many as sepalas or 0, yellow, usually entire. Stamens as many as or twice as many as sepals; anthers ovoid or oblong. Pollen shed in tetrad or singly. Stigma entire. Ovary with many pluriseriate or uniseriate ovules in each loculus. Capsule terete or with 4 or 5 ribs, angles or wings, irregularly loculicidal. Seeds ellipsoid, lacking hairs, free or embedded in endocarp at maturity, light brown. Basic chromosome number: x = 8.


FSA contributions 9: Onagraceae

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**Isnardia discolor** Klotzsch, in Peters: 70 (1861). Type: Mozambique, Zambezi R. between Sena and Lupata Mts. Peters s.n. (B, holo.)

Subglabrous erect herb, sometimes woody at base; 30 mm to more than 3 m tall, freely branched, stems sharply angled from decurrent leaf bases. Leaves 20–130 × 2–45 mm, lanceolate to elliptic, rarely ovate, main veins 16–27 on each side of midrib; petiole 2–15 mm long. *Bracteoles* ±. 0.5 mm long. *Sepals* 4, 2–6 × 1.0–1.5 mm. *Petals* 3.5–5.0 × 2.0–2.5 mm. * Stamens* 8. *Pollen* shed in tetrads. *Capsule* 10–19 × 2.0–2.5 mm, sharply 4-angled with 4 nearly flat walls, subsessile or on a pedicel up to 2 mm long. Seeds 0.3–0.4 (–0.5) × 0.2–0.3 mm, pluriseriate, free, pale brown, raphe narrow. Autogamous. Chromosome number: *n* = 8.

Native in the New World from Mexico and Florida to Brazil and Paraguay; introduced throughout tropical Africa, and in southern Botswana (Figure 1).

Voucher: Smithers s.n. (SRGH).


*J. angustifolia* Lam.: 331 (1789); Harv.: 504 (1862). Type: from the Moluccas.

*J. linearis* Willd.: 575 (1799); Peters: 70 (1861). Type: Guinea, Isert s.n. (B-Willdenow, photograph K.). *J. suffruticosa var. linearis* (Willd.) Oliv. ex Kuntze: 251 (1891); Brenan: 15 (1953b).

*J. linearis* Hochst.: 425 (1844), illegitimate homonym non Willd. 1799. Type: South Africa, KwaZulu-Natal, Umhloti and Umnqini Rivers, Krauss 73 (K, iso.).


Low herb, creeping and rooting at nodes, sometimes completely submerged, stems mostly 50–350 mm long, finely puberulent or glabrous. Leaves narrowly lanceolate to rounded, 5–30 × 3–10 mm, veins obscure; petioles 1–2 mm long. *Bracteoles* 0. Sepals 3 (rarely 4 or 5), 1–3 mm long. *Petals* 3 (rarely 4 or 5), 2.0–2.5 × 0.5–1.0 mm. *Stamens* 3 (rarely 4 or 5). *Pollen* shed in tetrads. *Capsules* plump, thin-walled, 3.5–9.0 × 1.3–2.0 mm, pale brown, readily and irregularly loculicidial, subsessile. *Seeds* showing clearly through capsule wall, in ± two rows in each locule, free, ovoid, ± 0.7 mm long, rounded at ends, light brown; raphe narrow and inconspicuous. Autogamous or cleistogamous. Chromosome number: *n* = 8.

Robust well-branched herb, up to 4 m tall, freely branched, subglabrous, puberulent, or densely villous. Leaves linear to subovate, 7–145 × 1–40 mm, 11–20 main veins on each side of midrib; petiole 10 to 10 mm long. *Bracteoles* 0 to 1 mm long. *Sepals* 4, 3–15 × 1.0–7.5 mm. *Petals* 3–17 × 1–2.7 mm. *Stamens* 8. *Pollen* shed in tetrads. *Capsule* 17–45 × 2–8 mm, terete, pale brown with 8 darker ribs, readily and irregularly loculicidial; pedicel up to 10 mm long. Seeds 0.60–0.75 × 0.5–0.7 mm including inflated raphe which is equal in size to body of ridged, free, brown seed. Autogamous. Chromosome numbers *n* = 16 (only number known for Africa), 24.

Throughout the tropics and subtropics of the world. In southern Africa in N Namibia, Northern Province, North West, Gauteng and Mpuumalanga, KwaZulu-Natal and also in southern Western Cape (Figure 1); wet places, 0–1 500 m. A careful study of this species throughout its range has led to the conclusion that it is best not to attempt to recognize infraspecific taxa in a formal taxonomic sense. The most distinct of the entities recognized earlier was *brevisepala* (Brenan) P.H.Raven, with sepals only 3–6 mm long, which is confined to but widespread in Africa. Vouchers: Acocks 19643; Rodin 3037, Schlechter 2803; J.M. Wood 5341.


Low herb, creeping and rooting at nodes, sometimes completely submerged, stems mostly 50–350 mm long, finely puberulent or glabrous. Leaves narrowly lanceolate to rounded, 5–30 × 3–10 mm, veins obscure; petioles 1–2 mm long. *Bracteoles* 0. Sepals 3 (rarely 4 or 5), 1–3 mm long. *Petals* 3 (rarely 4 or 5), 2.0–2.5 × 0.5–1.0 mm. *Stamens* 3 (rarely 4 or 5). *Pollen* shed in tetrads. *Capsules* plump, thin-walled, 3.5–9.0 × 1.3–2.0 mm, pale brown, readily and irregularly loculicidial, subsessile. *Seeds* showing clearly through capsule wall, in ± two rows in each locule, free, ovoid, ± 0.7 mm long, rounded at ends, light brown; raphe narrow and inconspicuous. Autogamous or cleistogamous. Chromosome number: *n* = 8.

Coastal Senegal to southern Sudan, Zaïre, and south to northern Namibia and probably northern Botswana.
FIGURE 2.—A–C, Ludwigia octovalvis. A, flowering branch, × 0.5. B, C, seed, × 17. B, side view; C, ventral view. D–K, L. adscendens subsp. diffusa. D, habit, × 0.5; E, flower bud, × 1.5; F, flower, × 1.5; G, style and stigma, × 6. H, I, stamen, × 6. H, ventral view; I, dorsal view. J, fruit, × 0.5; K, fruit splitting, × 0.5. A, Van Rensburg 858; B, Eyles 120', D, E, J, K, Robson & Fanshawe 679; F–I, Pope 154. Reproduced by kind permission of Flora Zambesiaca Managing Committee.

(Figure 3); wet places, sometimes completely submerged.

Vouchers: Merxmüller & Giess 1902; Vlok 1906.


J. pilosa Kunth: 101 (1823); Mogg in MacNae & Kalk: 150 (1958). Type: from Colombia.


Robust hairy plants to 3 m tall, reclining at base but erect and well branched, with erect floating pneumatophores, often forming large masses. Leaves broadly lanceolate, long-hairy, 35–180 × 10–40 mm, 11–20 main veins on each side of midrib; petiole 2–35 mm long. Bracteoles 0 or reduced. Sepals 5 (rarely 4, 6, or 7) 5.5–11 × 1.5–3.0 mm. Petals 5–11 × 4–8 mm. Stamens twice as many as sepals. Pollen shed in tetrads. Capsule relatively thin-walled, long-hairy, 15–50 × 2.5–4 mm, terete, dull light brown, with prominent ribs over locules and less prominent ones over septa, marked on outside with bulges ± 0.5 mm apart corresponding to position of seeds, slowly and irregularly loculicidal; pedicels 2–20 mm long. Seeds uniseriate in each locule of capsule, hor-
izontal, obovoid, 1–1.2 mm long, shiny pale brown; raphe much narrower than body of seed; each seed loosely embedded in an easily detached horseshoe-shaped segment of firm pale brown endocarp ± 1.0–1.5 mm thick and ± 1 mm high. Somewhat outcrossing but self-compatible. Chromosome numbers: \( n = 24 \) (in Africa), \( 16 \) (in New World).

In the Americas from the southeastern USA to Argentina and in Africa. Rare in southern Africa, in KwaZulu-Natal, northern Namibia and Botswana (Figure 3).

Vouchers: Carson 754; Killick & Leistner 3077; Tinley 225; Ward 5564.


Herb with prostrate or ascending stems, rooting at nodes, with conspicuous, white, erect, spindle-shaped, mucronate pneumatophores arising in clusters at nodes of floating stems and from roots; plants more or less densely villous to glabrous. Leaves narrowly lanceolate to narrowly elliptic, 20–90 × 0.5–3.5 mm, 13–22 main veins on each side of midrib; petiole 2–20 mm long. Bracteoles ± 1 mm long. Sepals 5, 5–14 × 1.5–2.8 mm. Petals 7–18 × 4–10 mm. Stamens 10. Pollen grains shed singly. Capsule 10–30 mm long, light brown, with 10 conspicuous darker brown ribs, terete, with bulges ± 1.5 mm apart, thick-walled, very tardily and irregularly dehiscent; pedicel 5–20 mm long. Seeds uniseriate, 1.1–1.3 mm long, pale brown, more or less vertical, firmly embedded in coherent cubes of woody endocarp 1.2–1.5 × 1.0–1.2 mm, endocarp firmly fused to capsule wall. Somewhat outcrossing but self-compatible. Chromosome number: \( n = 16 \).

Northern Namibia, Botswana and throughout eastern southern Africa (Figure 5), widely distributed in Africa and Middle East; wet places especially along rivers and lakes and often floating, sometimes forming large masses.
7. **Ludwigia palustris** (L.) Elliott, A sketch of the botany of South Carolina and Georgia 1: 211 (1817); Harv.: 505 (1862); P.H.Raven: 399 (1963); Schreiber: 4 (1967); Ross: 262 (1972); P.H.Raven: 342 (1978).  

*Isnardia palustris* 0.8-1.8 mm. to 0.5 m long or perhaps longer, well-branched and opposite leaves, stems at most ascending-decumbent, up (1967); Ross: 262 (1972); P.H.Raven: 342 (1978).  

Botany of South Carolina and Georgia 1: 211 (1817); Harv.: 505 (1862); P.H.Raven: 399 (1963); Schreiber: 4 (1967); P.H.Raven: 343 (1978). Type species: from Europe.  

Glabrous herb, creeping and rooting at nodes, with opposite leaves, stems at most ascending-decumbent, up to 0.5 m long or perhaps longer, well-branched and forming mats. *Leaves* broadly elliptic or subovate, 7-45 mm x 4-23 mm, 4-8 main veins on each side of midrib. *Bracteoles* 0 or up to 1 mm long.  

Capsule boxy-globose, (2.0—)2.5-5.0 x 2-3 mm, obscurely 4-angled, dull light brown, smooth and somewhat corky-walled, but fairly readily and irregularly loculicidal, with a broad green band 0.4-0.5 mm wide on each angle of capsule. *Seeds* pluriseriate in each locale, free, elongate-ovoid, 0.6-0.9 x ± 0.3 mm thick, light brown; raphe very narrow. *Autogamous. Chromosome number: n = 8.*  

Throughout southern Africa (Figure 6); widespread from temperate North America to Colombia, in Eurasia to Iran and in Africa N of the Sahara and in southern Angola; margins of streams, lakes, wet places.  

Vouchers: Dieterlen 1002; Galpin 10128; Parker 4852; Schlechter 6413; Thode A1212.

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1. **Epilobium hirsutum** L., Species plantarum 347 (1753); Harv.: 506 (1862); Hausskn.: 53 (1884); Burtt Davy: 201 (1926); Adamson: 605 (1950); Schreiber: 2 (1967); P.H.Raven: 312 (1967); R.Fern. & A.Fern.: 200 (1970); P.H.Raven: 343 (1978). Type: from Europe.  

E. hirsutum Vent.: t. 90 (1802); Brenan: 2 (1953b). Type: from Persia, cultivated in France.  

E. mires Quezel: 90 (1957). Type: Chad, Tigui, in 1956, Quezel s.n. (herb. Quezel, holotype).  

Robust herb 0.2-2.5 m tall; rhizome stout; plants more or less white-pubescent all over. *Leaves* mostly opposite, oblong-lanceolate, sessile, clasping at base, coarsely toothed, 20-120 x 4-30 mm. *Inflorescence* with an admixture of glandular trichomes, erect in bud; flowers erect in bud. *Floral tube* 2.5-3.0 mm across, ± 1.0-1.5 mm deep. Sepals 6-10 x 2.0-2.5 mm. *Petals* 6-16 x 6-15 mm, bright purplish rose. *Style* 6-10 mm long; stigma deeply 4-lobed, held above anthers at anthesis.  

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5795000 EPILOBIUM  

**Epilobium** L., Species plantarum 347 (1753); Harv.: 506 (1862); Adamson: 605 (1950); Schreiber: 1 (1967); P.H.Raven: 309 (1967); R.Fern. & A.Fern.: 199 (1970); Ross: 262 (1972); R.A.Dyer: 410 (1975); P.H.Raven: 343 (1978). Type species: *E. hirsutum* L.  


A large cosmopolitan genus of ± 185 species, with a centre of diversity in North America, 10 species in Africa, four native in southern Africa and fairly widespread.

1a Stigma deeply 4-lobed:  
2a Stems clothed with long, spreading pubescence; leaves sub-sessile, distinctly clasping at base; fleshy scales absent at base of plant ............................. 1. *E. hirsutum*  
2b Stems clothed with lustriginate pubescence; leaves distinctly petiolate, rounded to obtuse or more rarely subcircular at base with petioles 1.0-2.5 mm long; underground stems invested with white, fleshy, rounded scales ............................................. 3. *E. capense*  
1b Stigma entire, clavate:  
3a Leaves narrow, sub-sessile and strongly decurrent; flowers erect at anthesis; petals pale lilac to pink, 2.5-3.5 mm long .................................................. 2. *E. tetragonum*  
3b Leaves broader, distinctly petiolate, narrowly cuneate at base; flowers nodding in bud and when opening first, later erect; petals at first white or cream, rose following pollination, 5-15 mm long ..... 4. *E. salignum*  

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FIGURE 5.—Distribution of Ludwigia adscendens subsp. diffusa.

FIGURE 6.—Distribution of Ludwigia palustris.
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FIGURE 7.—Distribution of Epilobium hirsutum.

thesis, lobes 1.5–2.5 mm long. Capsules 30–80 mm long; pedicel 2–12 mm long. Seeds oblong-obovoid, acute at base, coarsely papillose, 0.90–1.15 mm long, dark brown or even coppery, coma 5–7 mm long, dull white. Outcrossing but self-compatible. Gametic chromosome number: n = 18. Protandrous.

Widespread in Africa, Europe and temperate Asia, in wet places. In southern Africa it occurs on the Waterberg in Namibia and throughout South Africa (Figure 7), predominantly in montane regions.

Vouchers: Rehmann 4752', Rodin 2586; Rudatis 1649; Schlechter 10446.

2. Epilobium tetragonum L., Species plantarum: 348 (1753); Harv.: 597 (1862); Adamson: 606 (1950). Type: from France.


Perennial herb 0.1–1.0 m tall, producing leafy rosettes from short stolons near base in autumn; plants strigillose, especially above, and with raised lines running down from bases of petioles, these pubescent above. Leaves mostly opposite, subsessile and usually decurrent on stem, narrowly lanceolate to nearly elliptical, 15–75 × 3–15(–21) mm, bluish green, evenly and strongly dentate-ulate. Inflorescence erect in bud; flowers erect or somewhat drooping in bud. Floral tube ± 1 mm across and deep. Sepals 2.8–4.2 × 0.8–1.8 mm. Petals 2.5–5.0(–7.0) × 2.0–3.5(–4.5) mm, pale lilac to pink. Stigma entire, clavate. Capsules (35–)50–110 mm long, on a pedicel 1.2–3.0 mm long. Seeds oblong-obovoid, acute at base, coarsely papillose, 1.0–1.3 mm long, brown, coma ± 8–10 mm long, dull white. Autogamous or cleistogamous. Gametic chromosome number: n = 18.

Perennial herb 0.1–1.2 m tall; underground stems vertical or nearly so, densely invested with thick white, fleshy, rounded scales ± 4 × 2–10 mm after first year; plants strigillose with some glandular trichomes in the more densenarrowly lanceolate, serrate with prominent forward-directed teeth, 20–50 × 0.4–2.5 mm; petioles 1.0–2.5 mm long. Inflorescence erect in bud; flowers erect or somewhat drooping in bud. Floral tube 2.0–2.5 mm across, 1.1–1.5 mm deep. Sepals 4.2–10.0 × 1.2–2.5 mm. Petals 6–16 × 3.0–10.5 mm, bright rose-purple, paler purplish, creamy, or white. Stigma white, 4-lobed. Capsules 30–90 mm long; pedicel 10–60 mm long. Seeds oblong-obovoid, papillose, 1.3–1.6 mm long, brown, coma 5–7 mm long, dingy white. Outcrossing or self-pollinating. Gametic chromosome number: n = 18.

Moist places and mountain meadows in Madagascar and in Africa from southern Tanzania to the southern Western Cape (Figure 10).

Vouchers: MacOwan 729; Schlechter 10095; Tyson 1813; Wood 686.

4. Epilobium salignum Hausskn. in Osterreichische Botanische Zeitung 29: 90 (1879); Hausskn.: 236 (1884); Brenan: 5 (1953b); P.H.Raven: 331 (1967);

Vouchers: Bolus 215; Dieterlen 936; Parker 3638; Schlechter 6129; Thode A320.

FIGURE 8.—Distribution of Epilobium tetragonum subsp. tetragonum.

E. neriophyllum Hausskn.: 19 (1880). Type: South Africa, Eastern Cape, Somerset East, Boschberg 900 m, MacOwan 1487 (K, lecto.; GRA, NH iso. lecto.).

E. mundtii Hausskn.: 235 (1884). Type: South Africa, Western Cape, Cape Peninsula, in 1820, Mundt & Maire s.n. (JE, lecto.).


E. oliganthum Baker: 345 (1886) nom. illeg., non Michx. (1803).


E. madagascariense H.Lév.: 225 (1907). Type: Madagascar, Ranobé, near Sirabe, in 1895, Forsyth-Major s.n. (G, holo.).

E. perrieri H.Lév.: 3 (1917). Type: Madagascar, Ankaraatra, 900 m, Perrier 6630 (P, lecto.).

E. schinzii H.Lév.: 225 (1907). Type: South Africa, KwaZulu-Natal, Noodsberg, 600–900 m, J.M. Wood 5282 (Z, holo., not seen; BM, NH, SAM, iso.).
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PERENNIAL HERBS 0.2-1.6 M TALL; STRONGLY RHIZOMATOUS; RHIZOMES LACKING SCALES, LONG-SPREADING AND GIVING RISE TO NEW LEAFY SHOOTS; PLANTS EVENLY STRIGILLOSE, SOMETIMES SPARSELY SO, WITH FAINTLY MARKED LINES RUNNING DOWN FROM MARGINS OF PEDICELS. LEAVES MOSTLY OPPOSITE, VERY NARROWLY TO NARROWLY ELLIPIC, RARELY ALMOST LANCEOLATE, WEAKLY SERRULATE OR RARELY SERRATE, 20-80 X 3-20 MM; PETIOLE 1-8 MM LONG. INFLORESCENCE ERECT IN BUD, TO 300 MM LONG; BRACTS USUALLY NOT MUCH REDUCED; FLOWERS NODED IN BUD AND WHEN OPENING FIRST, LATER ERECT. FLORAL TUBE 0.8-2.0 MM ACROSS, 1.5-2.3 MM DEEP. SEPALS 3.5-8.5 X 1.2-2.2 MM. PETALS 5-15 X 2-7 MM, AT FIRST WHITE OR CREAM, THEN ROSE FOLLOWING POLLINATION. STIGMA USUALLY CLAVATE, RARELY SUBCAPITATE, ENTIRE. CAPSULES 30-70 MM LONG, ON A PECIDEL 8-45 MM LONG. SEEDS OVOID, OBLONG-OVOVOID, OBTUSE AT BASE, MINUTELY RETICULATE, 1.00-1.35 X 0.35-0.60 MM; LIGHT BROWN OR TAN, COMA ± 5-9 MM LONG, COPIOUS, WHITE. MAINLY AUTOGAMOUS. GAMETIC CHROMOSOME NUMBER: \( n = 18 \).

EXTENDING IN SOUTHERN AFRICA ALONG THE EASTERN MOUNTAINS TO THE TRANSKEI, INCLUDING LESOTHO AND SWAZILAND (FIGURE 11), FROM THE HIGHLANDS OF TROPICAL AND TEMPERATE AFRICA AND MADAGASCAR; MOIST PLACES, 500-3 000 M.

Vouchers: Flanagan 665; Rudatis 1346; Scheepers 625.

5819000 GAURA


Gauridium Spach: 379 (1835a).
Schizocarya Spach: 325, 381 (1835b); Spach: 170, 283 (1835c).

ANNUAL, BIENNIAL, OR PERENNIAL HERBS. LEAVES ALTERNATE, ENTIRE TO DEEPLY LOBED. STIPULES 0. INFLORESCENCE A SPICATATE RACEME, SHARPLY DELIMITED, NOT LEAFY, MORE OR LESS CONSPICUOUSLY PEDUNCULATE. FLOWERS USUALLY STRONGLY ZYGOMORPHIC, BORNE IN AXILS OF MUCH REDUCED UPPER LEAVES (BRACTS), OPENING EITHER NEAR SUNSET OR NEAR SUNRISE AND FADING WITHIN A DAY. FLORAL TUBE PRESENT, LONG AND NARROW. SEPALS 4, CADUCOUS. PETALS 4, WHITE, USUALLY SHARPLY CLAWED, ENTIRE. STAMENS 8; ANTHERS LINEAR, SPOROGENOUS TISSUE DIVIDED BY STERILE TISSUE INTO DISCRETE PACKETS. POLLEN SHED SINGLY. STIGMA DEEPLY 4-LOBED. Ovary with 1 or 2 OVULES IN EACH LOCULE. CAPSULE DEHISCENT, NUTLIKE, WITH HARD, WOODY WALLS, SEPTA INCOMPLETE AND FRAGILE, NOT EVIDENT AT MATURITY. SEEDS OVOID, YELLOWISH TO PALE BROWN. BASIC CHROMOSOME NUMBER: \( x = 7 \).

A GENUS OF 21 SPECIES OF NORTH AMERICA, CENTRING IN THE GREAT PLAINS AND TEXAS. TWO SPECIES ARE NATURALIZED IN SOUTH AFRICA.

1a INFLORESCENCES STRIGILLOSE; PLANTS RHIZOMATOUS; FLOWERS OPENING NEAR SUNSET; FRUITS EVIDENTLY STIPITATE, WITH STIPE 2-8 MM LONG........................................................................ 1. G. sinuata

1b INFLORESCENCES VILLOUS; PLANTS CLUMPED; FLOWERS OPENING NEAR SUNRISE; FRUITS Sessile, Broad-Based.............. 2. G. lindheimeri

1. Gaura sinuata Nutt. ex Ser. in DC., Prodromus 3: 44 (1828). Type: from USA.

Agressively rhizomatous perennial herb, forming extensive mats with well-branched stems 200-600 MM TALL; PLANTS SUBGLABROUS OR SPARSELY PUBESCENT, STEMS STRIGILLOSE AND WITH LONG, SPREADING HAIRS; LEAVES DEEPLY STRIGILLOSE IN RELATIVELY HAIRY PLANTS. LEAVES LINEAR TO NARROWLY OBLANCEOLATE, 10-110 X 1-20 MM, SPARSELY SUTERA-DENTATE, RARELY SUBENTIRE, OFTEN UNDULATE. INFLORESCENCE 100-300 MM LONG, SIMPLE OR BRANCHED; BRACTS LANCEOLATE TO NARROWLY OvATE, 1-5 X 0.5-2.0 MM. FLOWERS OPENING NEAR SUNSET. FLORAL TUBE 2.5-5.0 MM LONG. SEPALES 7-14 X 1.25-2.50 MM, STRIGILLOSE. PETALS 7.0-14.5 X 3-7 MM, WHITE, FADING PINK. Ovary outside of floral tube, strigillose. Body of capsule 8-15 X 1.5-3.5 MM; STIPE 2-8 MM LONG. SEeds (1-)2-4 X 2-3 MM, LIGHT TO REDDISH BROWN. SELF-INCOMPATIBLE. GAMETIC CHROMOSOME NUMBER: \( n = 14 \).

Native to USA, Texas and Oklahoma; Widely introduced elsewhere in USA, in Italy and locally in South Africa on Van Staden’s Pass (Figure 12); A noxious weed limited by self-incompatibility.

Vouchers: Theron 1837; Wells 3192.

2. Gaura lindheimeri Engelm. & A.Gray in Boston Journal of Natural History 5: 217 (1845). Type: from USA. Figure 13.

G. filiformis Small var. muzeis Cory: 420 (1937). Type: from USA.

Robust clumped perennial herb, usually branching copiously from a heavy underground crown; stems erect or...
more often arching outward from crown to form a full, clumped plant 0.5–1.5 m tall; entire plant villous, inflorescence with a more or less dense admixture of glandular trichomes. Leaves very narrowly elliptic (to occasionally narrowly oblanceolate), 5–90 × 0.1–1.3 mm, coarsely and remotely serrate, occasionally subsinuately so. Inflorescence 100–800 mm long, well branched or simple; bracts narrowly to broadly elliptic, 4–11 × 1.5–6.0 mm. Flowers opening near sunrise. Floral tube 4–9 mm long. Sepals 8.5–17.0 × 1–2 mm. Petals white, fading to light or deep pink, 10.5–15.0 × 5–10 mm. Capsule 6–9 × 2.0–3.5 mm. Seeds 1.4–2.3 × 1.0–1.5 mm, yellowish to light brown. Self-incompatible. Gametic chromosome number: n = 7.

Native to USA, Louisiana and Texas; widely cultivated and occasionally spontaneous; occurring in South Africa in Gauteng, Free State and the Western Cape (Figure 13).

Vouchers: Galpin 14525; Goldblatt 1436; Leach & Bavill 12582.

5804000 OENOTHERA*

Oenothera L., Species plantarum 346 (1753); L.: 163 (1754); Harv.: 505 (1862); Munz: 79 (1965); Schreiber: 5 (1967); P.H. Raven: 330 (1978); R.A. Dyer 410 (1975). Type species: O. biennis L.

Annual, biennial, or perennial herbs. Leaves alternate, entire to pinnatifid. Stipules O. Flowers actinomorphic, borne in axils of reduced leaves, often clustered near ends of stems, opening either near sunset or near sunrise and usually fading within a day. Floral tube present. Sepals 4, caducous. Petals 4, yellow, white or rose-purple, usually entire. Stamens 8; anthers linear. Pollen shed singly. Stigma deeply 4-lobed. Ovary with many plurisinate or unisinate ovules in each locule. Capsule stout, loculicidal. Seeds lacking hairs, free, usually brown. Basic chromosome number: x = 7.

Approximately 125 species, all native to North and South America, but widely naturalized in the Old World; 14 species recorded in southern Africa.

1a Petals white or rose-purple; flowers opening near sunrise or sunset; capsules evidently clavate: 1b Petals yellow; flowers opening near sunset; capsules not evidently clavate, sometimes slightly enlarged in upper 200–600 mm long, well branched or 3a Floral tube longer than 60 mm: 3b Floral tube shorter than 60 mm: 6a Capsules broad at base; seeds sharply angular; open flowers ± reaching apex of stem: 7a Petals 35–50 mm long 7b Petals 7–25 mm long: 8a Floral tube 10–18 mm long; plant exclusively appressed pubescent (strigillose) throughout 5. O. villosa 8b Floral tube 20–50 mm long; plant glandular pubescent and with eglandular spreading hairs (villose): 9a Tips of sepals subterminal, divergent; petals 7–20 mm long; tip of inflorescence often arched 4. O. parviflora 9b Tips of sepals terminal, erect; petals 10–25 mm long; tip of inflorescence erect 2. O. biennis 6b Capsules cylindrical or tapering at base; seeds rounded, not sharply angular; open flowers well-spaced down stem, not especially clustered above: 10a Leaves usually deeply and coarsely toothed; buds curved upward 11. O. lucinata 10b Leaves with ± blunt, shallow teeth or entire to remotely sinuate-dentate; buds various: 11a Petals 15–45 mm long: 12a Stems prostrate or decumbent; plant canescent; mature buds curved upward; leaves entire to remotely sinuate-dentate 12. O. drummondii 12b Stems erect; plant ± strigillose, never canescent; mature buds erect; leaves serrate 9. O. stricta 11b Petals 3–12 mm long: 13a Plants appearing glabrous to naked eye, but actually with very short erect hairs; bracts cuneate at base, as long as or longer than capsules they subtend; capsules 1.5–2.0 mm thick 6. O. indecora 13b Plants evidently pubescent; bracts rounded at base, clearly shorter than capsules they subtend; sepals often flecked with dark reddish brown; capsules 2–3 mm thick . 10. O. parodiana subsp. parodiana

*In collaboration with Werner Dietrich, University of Düsseldorf, and Warren Wagner, Smithsonian Institution, Washington DC.

Stout, erect winter annuals or biennials, simple or sparsely branched, ± 1.0—1.5 m tall, forming a rosette; stems strigillose, with scattered longer subapressed hairs, red papillae few or 0. Leaves: rosette leaves 60—200 mm long; cauline leaves broadly lanceolate, conspicuously sinuate-serrulate, acuminate at apex, strigillose, 50—120 × 14—35 mm; petioles 0—12 mm long. Bracts 10—50 mm long. Floral tube 80—130 mm long, strigillose. Sepals 35—60 mm long, strigillose, with free tips 3—6 mm long. Petals 10—50 mm long, yellow. Anthers 12—22 mm long. Capsule 20—50 × 6—10 mm, strigillose but with short fine and longer coarser hairs. Seeds sharply angled, 1.5—2.0 mm long. Outcrossing but self-compatible. Chromosome number: n = 7 (ring of 14 at meiotic metaphase I).

Native to North America, first recorded from the Cape Peninsula by Thunberg in 1772—1775, and occasionally since (Figure 15).

Vouchers: Ecklon & Zeyher 1762; Esterhuysen s.n.; Salter 8895.

2. Oenothera villosa Thunb., Prodromus plantae capensis: 75 (1794); W.Dietr. & P.H.Raven: 382 (1976). Type: South Africa, Western Cape, without precise locality, Thunberg s.n. (UPS, holo.).

O. biennis L. sensu Harv.: 505 (1862) pro parte.
O. strigosa subsp. canovirens (Steele) Munz: 136 (1965). Type: from USA.

The African plants belong to subsp. villosa.

Biennial 50—200 mm tall, simple or branched plants, forming a rosette, exclusively greyish strigillose throughout, some of hairs arising from red papillae. Cauline leaves narrowly lanceolate, acute to subacute at apex, 70—150 × 14—30 mm. Bracts 10—50 mm long. Floral tube 20—37 mm long, strigillose. Sepals 10—18 mm long, strigillose, free tips 1—3 mm long. Petals 8—15 (—17) mm long, yellow, often ageing orange. Anthers 4—7 mm long. Capsules 18—43 × 4—6 mm, strigillose. Seeds sharply angled, 1—2 mm long. Autogamous. Chromosome number: n = 7 (ring of 14 at meiotic metaphase I).

Native of North America, first recorded from the Cape Peninsula by Thunberg in 1772—1775, and occasionally since (Figure 15).

Vouchers: Codd 2756; Galpin 2585; Studler s.n.
3. Oenothera biennis L., Species plantarum 346 (1753); non sensu Harv.: 505 (1862) vide O. villosa; Munz: 132 (1965). Type: from Europe.

Weedy biennial 0.3–2.0 m tall, simple or branched, forming a rosette; stems pubescent throughout with short appressed hairs (strigillose) and usually longer curved or spreading hairs, some arising from red papillae. Cauline leaves lanceolate, sinuate-denticulate, sharply acute to acuminate at apex, strigillose and with some longer hairs, 80–170 × 20–50 mm; petioles short or O. Bracts 10–40 mm long. Floral tube 25–40 mm long, with some gland-tipped as well as non-glandular hairs. Sepals 8–28 mm long, pubescent as in floral tube, free tips terminal, erect, 1.5–3.0 mm long. Petals 10–25 mm long, yellow, generally aging old gold. Anthers 4–7 mm long. Capsule 14–40 × 3–6 mm, strigillose and villous to subglabrous. Seeds sharply angled, 1.2–1.8 mm long. Autogamous. Chromosome number: n = 7 (ring of 14 or ring of 8 and ring of 6 at meiotic metaphase I).

Native of eastern USA and Canada. Local in southern Africa in Northern Province, North-West, Gauteng, Mpumalanga, Lesotho and northern Karoo (Figure 14). First recorded in 1910 at the Crocodile River (Emarco District).

Vouchers: Burnt Davy 9311; Collins 9884; Werger 1330.


O. erythrosepala (Borbas) Borbas: 203 (1902); Borbas: 245 (1903); Munz: 130 (1965). Onagra erythrosepala Borbas: 203 (1902).

Erect, bushy biennial to short-lived perennial, 0.8–1.2 m tall, forming a rosette; stems ± densely crisp-puberulent and with numerous longer spreading hairs, many arising from red papillae. Cauline leaves broadly lanceolate to ovate-oblong, crinkled, obtuse to acute at apex, substrigillose, mostly 50–100 × 25–40 mm; petioles 0–20 mm long. Bracts 10–30(–50) mm long. Floral tube 35–50 mm long, glandular-pubescent and villous. Sepals 30–40 mm long, glandular-puberulent and villous, free tips 5–8 mm long. Petals 35–50 mm long, yellow. Anthers 10–12 mm long. Capsule 20–25(–30) × 5–6 mm, villous and glandular-puberulent. Seeds sharply angled, 1.3–1.7 mm long. Outcrossing but self-compatible. Chromosome number: n = 7 (ring of 12 and 1 bivalent at meiotic metaphase I).

A species of garden origin, widely distributed in cultivation and as a naturalized plant in the Old World and North America; in southern Africa local throughout eastern southern Africa, although not in Swaziland, and as far south as Knysna (Figure 16). First recorded in 1891 at the Crocodile River (Emarco District).

Vouchers: Dieterlen 633; Flanagan 723; Fourcade 2048; Strey 7285.

5. Oenothera parviflora L., Systema naturae edn 10: 988 (1759); Munz: 121 (1965). Type: from North America or Europe.

Weedy biennial 1.0–1.5 m tall, simple or branched, forming a rosette; stems subglabrous to strigillose-puberulent and with looser longer spreading hairs that may arise from red papillae. Cauline leaves narrowly lanceolate, shallowly denticulate, acute to subacuminate at apex, strigillose to subglabrous, 50–120 × 12–30 mm; petioles short. Bracts 10–30 mm or longer. Floral tube 20–40 mm long, subglabrous or strigillose or more or less glandular-pubescent and strigillose, often also with somewhat stiffer erect hairs. Sepals mostly 8–20 mm long, usually pubescent as in floral tube, sometimes almost shaggy-villous, free tips subterminal, divergent, 1–5 mm long. Petals 7–20 mm long, yellow, aging somewhat orange. Anthers 4–7 mm long. Capsule 15–40 × 3–6 mm, ± scattered to densely villous and ± strigillose, only strigillose or almost glabrous. Seeds sharply angled, 1.2–1.8 mm long. Autogamous. Chromosome number: n = 7 (ring of 14 at meiotic metaphase I).

Native of eastern USA and eastern Canada. Recorded in southern Africa locally in Western Cape between the Peninsula and Stellenbosch (Figure 16). First recorded in 1884.

Vouchers: Goldblatt 1435; Marloth 86; Parcell 442.


Erect annual with several branches, up to 600 mm tall from base, everywhere covered with fine, erect pubescence. Leaves 10–60 mm long, sinuate-dentate, lanceolate or narrowly ovate, sessile. Inflorescence erect, buds also erect; flowers borne in axes of much reduced leaves, opening near sunset. Floral tube 8–15 mm long. Sepals 5–6 mm long with slender free tips ± 1 mm long. Petals 3–6 mm long, bright yellow, fading reddish. Anthers ± 2 mm long, filament 4–6 mm long. Style surrounded by anthers at anthesis; stigma with linear lobes 2–3 mm long. Capsule 15–22 × 1.5–2.0 mm, cylindric, not winged, subsessile. Seeds 0.7–1.3 mm long, broadly el-
FIGURE 17.—Distribution of Oenothera indecora.

FIGURE 18.—Distribution of Oenothera longiflora.

sparsely long-villous, and densely glandular-pubescent. Cauline leaves ciliate to narrowly lanceolate, apex acute, acute to rounded at base, sessile, 50–150 × 5–15 mm. Bracts (30–)40–90 mm long. Floral tube 80–110(–130) mm long. Sepals 20–35 mm long, free tips 1.5–4.0 mm long, erect or divergent. Petals very broadly obovate, (15–)20–40 mm long, yellow. Anthers 10–14 mm long. Capsule 20–40(–50) × 3–4 mm, thicker in upper third, with 4 valves clearly separated at apex. Seeds ellipsoid in outline, 1.5–2.0 × 0.5–0.6 mm. Outcrossing but self-compatible. Chromosome number: n = 7 (7 bivalents or ring of 14 at meiotic metaphase I).

Native in South America, and widely naturalized elsewhere. Reported in southern Africa, from coastal KwaZulu-Natal, Lesotho, Northern Province, Northwest, Gauteng and Western Cape (Figure 19). First recorded in 1902 in the central Northern Province.

Vouchers: Adamson 3076; Burtt Davy 1248; De Jongh sub Galpin 6529; Dieterlen 1352.

9. Oenothera stricta Ledeb. ex Link (‘striata’), Enumeratio plantarum horti regii berolinensis altera 1: 377 (1821); Munz: 661 (1935), tab. 82, figs B1–B9; P.H.Raven: 330 (1978); W.Dietr. 536 (1978). Type: from Chile. Figure 20C–K.
O. nocturna sensu Harv.: 506 (1862), non Jacq.; Burtt Davy: 202 (1926). Type: from South Africa.

The African plants are subsp. stricta.

Annual or short-lived perennial, forming a rosette, often flowering in first year, with several stout stems 0.3–1.0 m tall from a taproot, subglabrous below, villous and glandular pubescent above. Cauline leaves 20–80 mm long, narrowly oblanceolate, sparsely serrulate, sessile. Flowers in axils of much reduced upper leaves. Floral tube 20–45 mm long, slender. Sepals 15–22 mm long, with free tips ± 2 mm long. Petals 15–32 mm long, bright yellow, fading reddish. Anthers 7.0–8.5 mm long. Capsule cylindric, 20–40 × 3–4 mm, enlarged upward, not winged, sessile. Seeds ± 1–5 mm long, brown, obovoid, in 1 row in each locule. Autogamous. Chromosome number: n = 7 (ring of 14 at meiotic metaphase I).

Native to southern Chile and Argentina, widely naturalized elsewhere. Widespread in South Africa and Lesotho (Figure 21). First recorded in 1888, in Eastern Cape.

Vouchers: Dieterlen 169; Galpin 365; Leendertz 412; Parker 4391.

The African plants are subsp. *parodiana*.

Erect or somewhat decumbent annual or biennial, 300–700 mm high, forming a rosette, main stem simple or branched, obliquely ascending or arching side branches arising from rosette, densely to sparsely long- and short-villous and glandular-pubescent, or densely to sparsely villous and glandular-pubescent. *Cauline leaves* narrowly oblong to lanceolate or oblanceolate, acute, rounded to truncate at base, sessile, 25–150 × 5–10 mm. *Bracts* 10–20 mm long. *Floral tube* 10–20 mm long, sometimes flecked and streaked with red. *Sepals* 5–9 mm long, often flecked with red, free tips 1.0–1.5 mm long, erect or divergent. *Petals* 7–12 mm long, yellow. *Anthers* 3–8 mm long. *Capsule* 20–30 × 2.5–5.0 mm thick, valves often clearly separated at end. *Seeds* ellipsoid, 1.1–1.5 × 0.5–0.8 mm. Autogamous. *Chromosome number*: *n* = 1 (ring of 14 at meiotic metaphase I).

Native in South America, from southern Brazil to Argentina. In southern Africa, common in KwaZulu-Natal, Free State, Northern Province, North-West, Gauteng and Mpumalanga, and apparently local in Eastern Cape, southern Western Cape, Lesotho, and central Namibia (Figure 22). First recorded in 1909 in Mpumalanga, but becoming common only after 1940.

Vouchers: Leendertz 9202; Ruch 2328; Seydel 2686; Ward 6192.


Erect, often rank, annual, not forming a rosette, usually with many branches from base, these often decumbent and up to 0.4 m long, strigillose and densely villous above, especially in the inflorescence, also glandular-pubescent. *Cauline leaves* 10–80 mm long, sinuate-dentate or sinuate-pinnatifid, more rarely subentire, lanceolate, lower ones petiolate, upper ones sessile. *Flowers* borne in axils of much reduced leaves. *Floral tube* 12–35 mm long. *Sepals* 5–15 mm long, with slender free tips 0.5–3.0 mm long. *Petals* 5–22 mm long, bright yellow, fading reddish. *Anthers* 2–5 mm long. *Capsule* 15–50 × 2–4 mm, cylindric, not winged, subsessile. *Seeds* ± 1 mm long, obovoid, coarsely and conspicuously pitted, light brown. Autogamous. *Chromosome number*: *n* = 7 (ring of 14 at meiotic metaphase I).

Native in eastern N America. Widespread in eastern southern Africa, although not recorded from Swaziland, and the lowveld of Northern Province and Mpumalanga (Figure 23). First recorded in 1905 in KwaZulu-Natal.

Vouchers: Gordon Gray 863; Jacot Guillarmod 4717; Pont 669; Ward 3763.

The African plants are subsp. drummondii.

Suffrutescent perennial not forming a rosette, with prostrate or decumbent, mostly simple stems 200–500 mm long, densely canescent-pubescent throughout. Cauline leaves oblanceolate or more often oblong-ovate to -obovate, sessile or nearly so, densely appressed-pubescent, 10–40 mm long, often with one pair or more of rounded teeth or lobes near base, not much reduced up the stem. Flowers borne in axils of leaves. Floral tube 25–50 mm long, densely villous. Sepals 20–30 mm long, commonly reflexed in pairs at anthesis, free tips divergent, 1–3 mm long. Petals yellow, turning reddish, 25–45 mm long. Anthers 7–12 mm long. Capsule sessile, cylindrical, 25–55 mm long, about 3 mm thick, often curved, villous. Seeds ellipsoid to broadly ellipsoid, pitted, 1.0–1.2 mm long, brown. Outcrossing, but self-compatible. Chromosome number: n = 7 (usually 7 bivalents at meiotic metaphase I).

Native in coastal North America from S Carolina to eastern Mexico, with a second subspecies in lower California. Naturalized locally in southern Africa north of Durban and in the Port Elizabeth area (Figure 23). First reported in 1912.

Vouchers: Paterson 2343; Utton 316; Watmough 492.

13. Oenothera rosea L'Hér. ex Aiton, Hortus kewensis edn 1, 2: 3 (1789); Burtt Davy: 202 (1926); Schreiber: 5 (1967); P.H. Raven: 332 (1978). Type grown from seeds collected in Peru. Figure 20A, B.

Weedy perennial, not forming a rosette, often blooming in first year, 150–400 mm high, with numerous stems from a somewhat woody caudex, strigillose throughout, more densely so in inflorescence. Cauline leaves 20–50 mm long, oblanceolate to narrowly obovate, entire to somewhat pinnatifid at base of blade, acute, base narrowly cuneate; petioles 4–30 mm long, distinct. Flowers borne in axils of much reduced leaves. Floral tube 4–8 mm long, slender. Sepals 5–8 mm long, commonly coherent and deflexed to one side in anthesis. Petals 4.5–10.0 mm long, bright purplish rose. Anthers 2.5–4.0 mm long. Capsule clavate, 8–10 × 3–4 mm, strigillose, narrowly winged, base passing gradually into hollow, ribbed stipe 5–20 mm long. Seeds oblong-ovoid, ± 0.6 mm long. Autogamous. Chromosome number: n = 7 (ring of 14 at meiotic metaphase I).

Weed of American origin, now widespread in all warm parts of the world. Recorded throughout South Africa, Swaziland and Lesotho, and in extreme southern and northern Namibia (Figure 24). Introduced in the 1890's.

Vouchers: Burtt Davy 1039; Dieterlen 1317; Flanagan 589; Salter 8902.

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