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Polygonaceae (Buckwheat Family) of New York State

RICHARD S. MITCHELL
New York State Museum

J. KENNETH DEAN
New York State Museum

Contributions to a Flora of New York State I
Richard S. Mitchell, Editor

Bulletin Number 431
New York State Museum

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Albany, New York 12234

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The New York State Flora Committee

The steering council of the New York State Flora Committee met for the first time on January 19, 1976, and established as its goals the promotion of study of the State's plant resources and the publication of this series of Museum Bulletins. These contributions will be continually updated after publication for possible incorporation into larger volumes at a later date.

Members of the council at the time of this publication are:

- Richard S. Mitchell, Chairman, State Botanist, N.Y. State Museum, Albany (Vascular Plants)
- Stanley J. Smith, Curator of Botany, N.Y. State Museum, Albany (Vascular Plants)
- Robert T. Clausen, Botany Department, Cornell University, Ithaca (Vascular Plants)
- Edwin P. Ketchledge, College of Environmental Science and Forestry, Syracuse (Bryophytes)
- Clark T. Rogerson, New York Botanical Garden, New York (Fungi)
- George J. Schumacher, Biology Department, SUNY, Binghamton (Algae)

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PREFACE

OUR GOAL is to present a useful and authoritative account of the plants of New York State. This series of contributions is intended to reflect the knowledge and taxonomic opinions of specialists who prepare the manuscripts, while following a generalized format for consistency. Inclusion of ecological, distributional, medical and economic information on each species is also one of our major aims. Habitat references, flowering times, pertinent synonymy, etc., apply specifically to New York plants rather than to the entire ranges. Complete illustration should facilitate identification of specimens for those who are not formally trained in botany. Descriptions are original, ordered and as complete as possible to facilitate sequential cross-referencing.

Distribution maps accompany species of seed plants, ferns, mosses, lichens and some groups of fungi. These are plotted by counties to eliminate pinpointing endangered habitats, while providing an accurate visual picture of past collecting. Maps are based on the master file at the New York State Museum, Albany, and supplemented by available data (specimens examined by the authors) from herbaria housing significant New York collections. Specific data or literature citations for any map may be obtained, on approval, from the Museum.

We hope that these bulletins will serve individuals with interest in the flora, as well as to provide information for State and Federal agencies, conservation organizations, industry and the scientific community. With these works go our hopes for the preservation and wise use of a precious and lifegiving resource . . . our State's plantlife.

Richard S. Mitchell, Editor
1978

ACKNOWLEDGMENTS

We wish to express our sincere thanks to the staffs and curators of the following institutions for their complete cooperation and hospitality when we visited to study their collections: The U.S. National Herbarium (US), The New York Botanical Gardens (NY), Cornell University (CU, BH), Environmental Science and Forestry, Syracuse (SYRF), Harvard University (GH, NEBC), Brooklyn Botanical Gardens (BKL), SUNY, Brockport, (BROC), Buffalo Academy of Sciences (BUF). Data from the above institutions were added to the master file at the New York State Museum (NYS), Albany. This file was started by Homer D. House, and has been produced and maintained in large part by Stanley J. Smith. Illustrations are originals by J. Kenneth Dean. We wish to thank the steering council of the flora committee for their review and editorial comments. We especially wish to thank Ernest O. Beal for his detailed outside review. Our thanks also to Clark Rogerson for special attention to the bibliography and Appendix I, and to Timothy McCabe for nomenclatural help with Appendix II.

IMPORTANT NOTE

All economic uses, folklore, medical and pharmaceutical notes, uses as foodstuffs, etc., are compiled from the literature and do not represent an endorsement by the authors or the New York State Museum. Some of the uses may, indeed, be dangerous if incorrectly employed. Some are not effective and are presented for historical interest only.

Contributions to a Flora of New York State

Polygonaceae (Buckwheat Family)

The Polygonaceae: a cosmopolitan family of flowering plants including herbs, shrubs, vines and some trees; most members in boreal North America are annual or perennial herbs. Three genera, *Polygonum*, *Rumex* and *Polygonella*, are native to New York State. Buckwheat (*Fagopyrum*) and Rhubarb (*Rheum*) escape cultivation and may persist on disturbed sites. The seed-like fruits (achenes) are well-known wildlife foods, sown for waterfowl. Buckwheat is grown for human consumption as well as for livestock. Leaves of some Docks (*Rumex*) are boiled for pot-greens and medicine, and the cooked petioles of Rhubarb are used in stews and pies. Oily exudates of some *Polygonum* species are peppery and may cause eye irritation, hence such names as Water Pepper and Smartweed. Buckwheat and some species of Smartweed have been reported as bee plants which yield a pleasant honey.

Most members of the family are sun-loving, and their habitats range from disturbed ground to truly aquatic situations. A few are noxious weeds of cultivated fields and gardens.

FAMILY DESCRIPTION

Our native genera are characterized by sheathing, oblique or cylindric-tubular stipules (ocreae) which arise from more or less swollen, often multilacunar nodes. Sheathing stipules may shatter early or be persistent. Leaves are alternate and simple. Flowers are borne from within sheathing bracts (ocreolae) singly, in fascicles or in whorls. These are usually arranged in racemes or panicles which may be scattered or clustered into spike-like inflorescences. The perianth is of sepals only, but is usually petaloid, ranging in color from white to deep red-purple, yellow or greenish. Lobes of the perianth are 4–6, in a single series, or two whorls of three. Flowers may be bisexual (sometimes heterostyled) or unisexual, plants being monoecious, dioecious or polygamous. The single ovary has one basal ovule, and bears two or three styles. Stamens are 4–12 in number, sometimes associated with a glandular disc. Extrafloral nectaries are also known. The simple fruits are hard achenes, enclosed in the persistent perianth or exserted. Plants are perennial from stolons or rhizomes, biennial or annual from a taproot or fibrous root system.

KEY TO GENERA

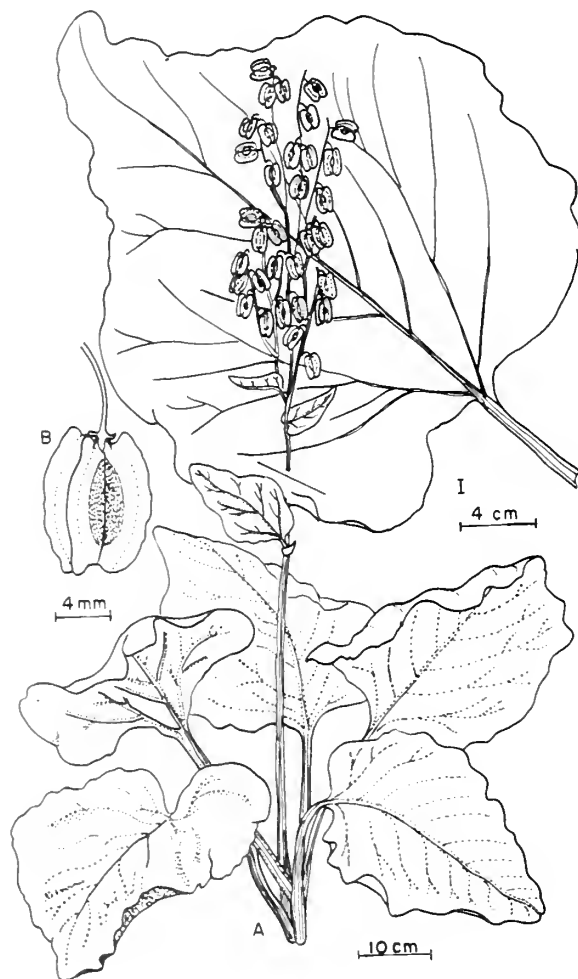
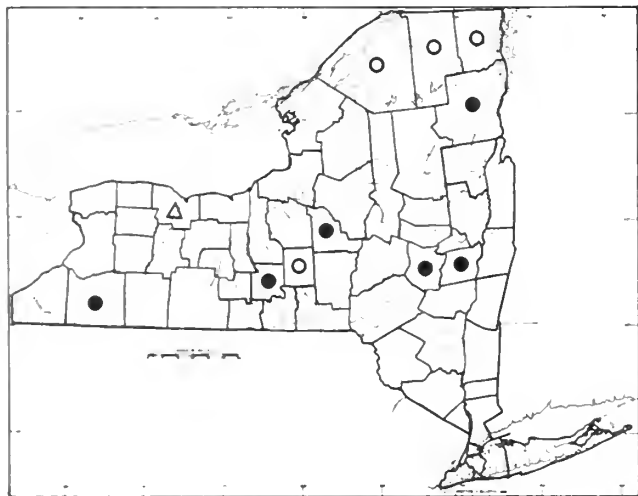
1. Basal leaves very large, 15–40 cm. in length and width, from broad, fleshy petioles; achenes winged.....1. *Rheum* (p. 2)
1. Basal leaves not so broad or robust; petioles not conspicuously fleshy; achenes not winged.....(2)
 2. Flowers 1 per bract, reflexed, in elongate terminal racemes; leaves linear, stiff, soon dropping.....5. *Polygonella* (p. 60)
 2. Flowers 2-more per bract, usually in whorls or fascicles which are scattered or densely compacted into inflorescences; leaves persistent, variously shaped.....(3)
3. Perianth lobes 6, in 2 whorls; fruit usually enclosed in a persistent perianth of wing-like valves, kernel-like tubercles or both.....2. *Rumex* (p. 3)
3. Perianth lobes 4–5; fruit enclosed in, or exserted from, an unspecialized or laterally winged perianth.....(4)
 4. Achene strongly exserted from the perianth, 5–7 mm. long.....(5)
 4. Achene enclosed or weakly exserted from the perianth, usually less than 5 mm. in length.....3. *Polygonum* (p. 20)
5. Leaves cordate-deltoid; flowers in panicles.....4. *Fagopyrum* (p. 58)
5. Leaves not cordate-deltoid; flowers in fascicles in the leaf axils.....3. *Polygonum* (p. 20)

1. RHEUM

Common Name: Rhubarb

A primarily Asiatic genus. Two species are widely cultivated in New York State. Of these, the Common or English Rhubarb escapes cultivation in sufficient numbers to be listed here.

Description: Flowers bisexual; stigmas 3, dilated and fimbriate-tufted; styles deflexed, short; ovary 3-angled, unilocular with a single orthotropous ovule; placentation basal; fruit a large, triquetrous achene with undulate wings; seed conforming to the achene walls; embryo exterior to the mealy endosperm; stamens usually 9; perianth of 6 lobes, the outer slightly larger; perianth remaining small, not accrescent or enclosing the achene; pedicels jointed; inflorescence a large, elongate panicle (in ours); basal leaves very large and broad; leaves much reduced upward toward the inflorescence; basal petioles fleshy; stems stout, hollow and tall; root fleshy, pink, perennial.



1. *Rheum rhaponticum* L.

Common Names: Rhubarb, English Rhubarb

Type Description: Linnaeus, Species Pl., p. 371, 1753

Origin: Siberia (spread through cultivation)

Habitats: Waste places and old fields

Habit: Stout perennial herb

Flowering: Late May-August

General Distribution: Northern United States and
Canada as an escape from cultivation (Eurasia)

Description: Flowers bisexual; stigmas 3, tufted and reflexed; styles 3; ovary 3-angled, becoming a strongly 3-winged achene, 8–10 mm. in length, dark brown with paler wings, not enclosed in the small perianth; stamens (6–8) 9; perianth of 6 lobes, greenish to white or pink; inflorescence a terminal panicle of fascicles and racemes, up to 30 cm. in length, ribbed, glabrous stalks up to 2 m. in height; leaves entire, crinkled, cordate-ovate to deltoid; basal leaves 20–40 cm. in diameter, palmately veined; petioles stout, ribbed, especially the lower ones; nodes and internodes stout, hollow; stems and petioles often striped with red and a blush of rose color; roots large, fleshy, pinkish ($2n = 44$).

Infraspecific Variability: Petioles may vary in fleshiness and color in the escapes; Bailey (1949) stated that the species name is used tentatively due to the possibility that cultivated Rhubarb represents a series of variants of possible hybrid origin.

Importance: Rhubarb is grown for its fleshy, edible petioles, which produce a tart sauce when boiled; the stewed petioles are usually sweetened and used in pies—frequently with strawberries or flavoring added; they are also used to flavor wine; due to high oxalic acid content of all parts, they should be cooked well to avoid urinary irritation; flowers have also been cooked; deaths reported from eating the greens are probably not from oxalate crystals, but from glycosides. Rhubarb has been known in cultivation in Europe since the 1760's, but did not become popular there or in America until mid-19th century. The roots contain rhapontin, and have been powdered for use as a laxative and for stomach pains.

2. RUMEX

Common Names: Dock, Sorrel

A circumboreal, almost cosmopolitan genus of herbs which occur in sunny sites, often disturbed ground and wet places. Some are spreading, noxious weeds. There are about 15 native and introduced species of *Rumex* in New York State. Hybrids appear to be more common than formerly reported, and these sometimes confuse the identifier.

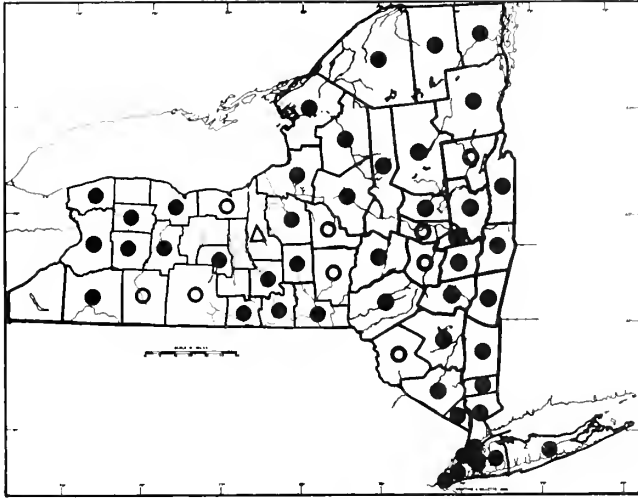
Description: Flowers bisexual or unisexual; plants with only perfect flowers or monoecious, dioecious or polygamous; **stigmas** 3, tufted, stellate-fimbriate; **styles** 3, often short and deflexed; **ovary** 3-angled, unilocular, with a single, orthotropous **ovule** adjacent to one wall; **placentation** basal; **fruit** a 3-angled achene enclosed with an accrescent inner perianth; **achene** pyramidal with shiny yellow-brown to red-brown or black surfaces; **seed** conforming within the achene walls; **embryo** nearly straight, lying along the flat surface of one achene wall, outside the mealy **endosperm**; **stamens** 6, in pairs opposite the outer perianth lobes; **filaments**, short, anther sacs basifixed, yellow to red or purple, nearly equaling the perianth at anthesis; **perianth** parts 6, green to reddish, in two whorls of 3, slightly united into a connate base; **outer lobes** linear to lanceolate, not enlarging in fruit, often becoming reflexed; **inner perianth parts** usually enlarging in fruit to become veiny valves, which enclose the fruit (fusing to it in one variety); **valves** entire to toothed or spined, with reticulate venation, variously shaped from oblong to triangular or cordate, much enlarged in some species; **fruiting perianth** greenish to yellow, red or usually browning with age; midvein of one or more valves developing callosities called **tubercles** ("grains") which may be smooth or variously pitted (some species are without tubercles); **pedicels** often jointed, becoming deflexed or flattened in some; **inflorescence** a terminal or axillary series of panicles, composed of fascicles of 3-many flowers; fascicles subtended by sheathing, usually scarious **bracts**; **leaves** simple, entire to crenulate, undulate or strongly crisped; **basal leaves** petiolate, often forming rosettes; **leaves and petioles** much reduced upward into the inflorescence where they are often called "bracts"; **stipules** tubular, hyaline and sheathing, but usually shattering early; **nodes** usually scarcely swollen; **internodes** glabrous, greenish to red, smooth or fluted; **stems** simple or branched, erect or ascending from an annual, biennial or perennial **taproot** system (rarely with runners).

KEY TO SPECIES OF RUMEX

NOTE: *Rumex* specimens should be collected with mature fruit (and runners, if present) or they are difficult to identify. Immature specimens should be compared with those in a good herbarium.

1. Plants dioecious (rarely polygamous); leaves hastate, sagittate or sometimes unlobed(2)
1. Plants monoecious or with bisexual flowers; leaves not sagittate or hastate.....(4)
 2. Perianth small, enclosing the fruit, not expanded into veiny valves1. *Rumex acetosella* (p. 5)
 2. Perianth expanded beyond the fruit into veiny valves(3)
3. Leaves mostly cauline, broadly sagittate midvein of some valves with tubercles when mature2. *Rumex acetosa* (p. 6)
3. Leaves more basal, narrowly hastate or unlobed; midvein of valves without tubercles3. *Rumex hastatulus* (p. 7)
 4. Perianth small in fruit, barely as broad as the achene4. *Rumex conglomeratus* (p. 8)
 4. Perianth or its spines expanded into valves extending well beyond the achene(5)

- 5. Valve margins entire or irregular-denticulate but not toothed or spined(9)
- 5. Valve margins with teeth or spines(6)
 - 6. Mature valves shallowly toothed, teeth not spine-tipped13. *Rumex crispus* X *obtusifolius* (p. 17)
 - 6. Mature valves with sharply pointed teeth or spines(7)
- 7. Well-developed tubercles 3; fruiting perianth with slender spines5. *Rumex maritimus* (p. 9)
- 7. Well-developed tubercle 1; fruiting perianth with sharp teeth.....(8)
 - 8. Leaves of the basal cluster conspicuously larger than the cauline leaves, frequently fiddle-shaped; pedicel jointed toward the middle; flower clusters not contiguous6. *Rumex pulcher* (p. 10)
 - 8. Leaves not fiddle-shaped; cauline leaves mostly broad, cordate-ovate; pedicels jointed obscurely near the base; flower clusters frequently contiguous7. *Rumex obtusifolius* (p. 11)
- 9. Stems with little or no lateral branching; leaves usually dark green to reddish(13)
- 9. Stems with well-developed lateral branching; leaves with a pale sheen.....(10)
 - 10. Fruiting pedicels strongly deflexed from their immediate bases, mostly uncurved, 2–5 times the length of the valves.....8. *Rumex verticillatus* (p. 12)
 - 10. Fruiting pedicels mostly curved, only one half to twice as long as the valves(11)
- 11. Tubercles broad, conspicuous, over half the width of the valves9. *Rumex pallidus* (p. 13)
- 11. Tubercles narrower, much less than half the width of the valves(12)
 - 12. Valves deltoid in outline; tubercles consistently 3 in number10. *Rumex triangulivalvis* (p. 14)
 - 12. Valves ovate-obtuse; tubercles developing inconsistently from 1–2 (3) per fruiting perianth
 -11. *Rumex altissimus* (p. 15)
- 13. Mature valves broader than long, kidney-shaped; tubercles undeveloped12. *Rumex longifolius* (p. 16)
- 13. Mature valves as long as, or longer than broad, cordate, obtusely pointed at tips(14)
 - 14. Well-developed tubercles 1 or 2(16)
 - 14. Well-developed tubercles on all three valves(15)
- 15. Pedicels jointed near the middle; leaves crisped and convoluted at the margins (weedy).....
 -13. *Rumex crispus* (p. 17)
- 15. Pedicels jointed below the middle; leaves not strongly crisped or convoluted (aquatic habitats)
 -14. *Rumex orbiculatus* (p. 18)
 - 16. Tubercle about half the length of the valve; valves 4–5 mm. long at maturity13. *Rumex crispus* (p. 17)
 - 16. Tubercle less than half the valve length; valves 6–9 mm. long.....(17)
- 17. Leaves pale green, margins flat, undulating or slightly crisped; mature valves about 8 m. long
 -15. *Rumex patientia* (p. 19)
- 17. Leaves dark, shiny green, margins crisped and convoluted; mature valves 5–6 mm. in length
 -13. *Rumex crispus* X *patientia* (p. 17)



1. *Rumex acetosella* L.

Common Names: Sheep Sorrel, Red Sorrel, Sour Grass

Type Description: Linnaeus, Species Pl., p. 338, 1753

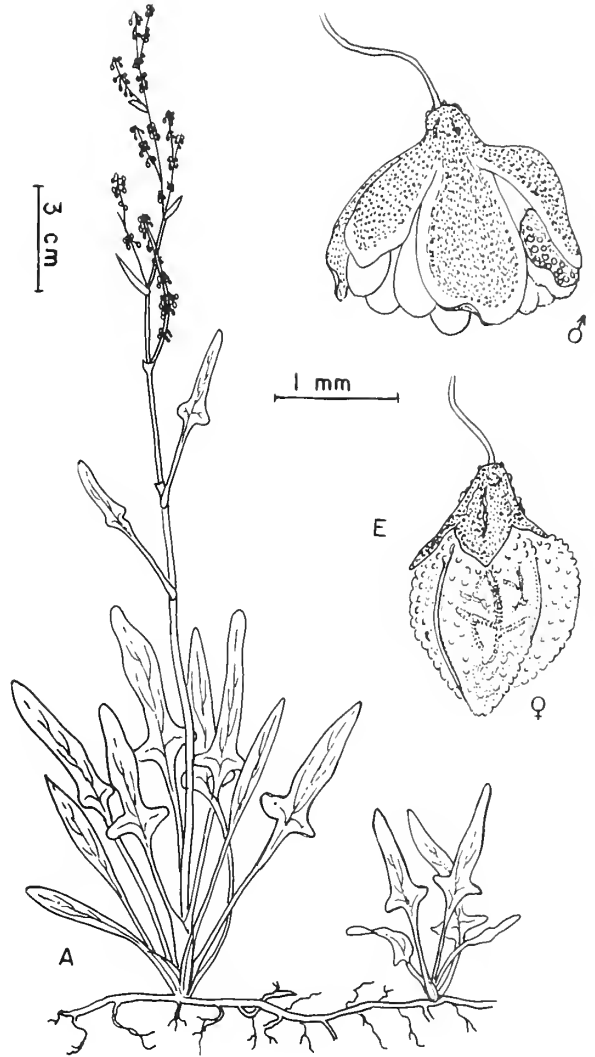
Origin: Eurasia

Habitats: Acid soil, fields, lawns and waste places

Habit: Erect to spreading perennial or occasionally annual

Flowering: April–September

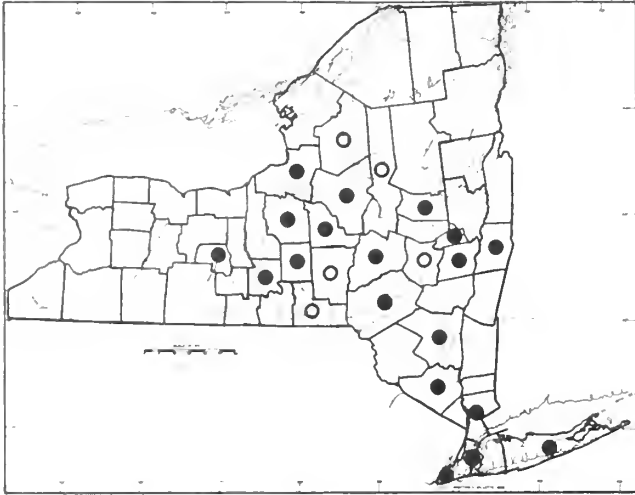
General Distribution: Ubiquitous weed of boreal climates



Description: Plants dioecious, rarely polygamous; **stigmas** 3, fimbriate, almost sessile on 3 short styles; **ovary** 1, becoming a weakly 3-angled achene; **achene** 1–1.5 mm. long, almost as broad, yellowish to reddish-brown; **stamens** 6; filaments short, anther sacs yellowish to red-tinged, equaling or slightly exceeding the perianth; **inner perianth lobes** of male flowers obovate, of females broadly ovate; **female perianth** about equaling the achene in fruit, not expanded into valves, and lacking tubercles or distinct innervation; **outer sepals** in both sexes lanceolate, reddish; **bracts** sheathing, usually red with hyaline, often lacerate tip; **inflorescence** a slender, much-branched panicle of small fascicles; **flowers** nodding on **pedicels** which are up to twice as long as the perianth; **leaves** mostly basal, usually hastate, but some lacking lobes, obovate to narrowly lanceolate, 3–8 cm. long, with narrowly attenuated basal lobes which are divergent (often upward); **petioles** of lower leaves often longer than the blades; **stipules** reddish or brownish, shattering, with lacerate, hyaline extremities; **nodes** slightly swollen, reddish; **internodes** ribbed, slender, glabrous; **stems** usually unbranched below the inflorescence, 20–40 cm. tall; plants usually arising from running **rhizomes** which are slender and can be several feet long ($2n = 14, 28, 42$).

Infraspecific Variation: A number of cytotypes and varieties have been described for this species. Our New York material seems to be mostly of the group described as ssp. *angiocarpus* (Murb.) Murb., in which the inner perianth becomes adnate to the achene. Hastate lobes are frequently missing from the leaves, even at the base.

Importance: The fresh, chopped herb has been used medicinally as a diuretic, refrigerant and diaphoretic; the juice has been used in kidney and urinary disorders; its sour taste derives partly from oxalate, however, so appropriate cautionary measures should be taken.



2. *Rumex acetosa* L.

Common Names: Garden Sorrel, Green Sorrel

Origin: Europe, probably England

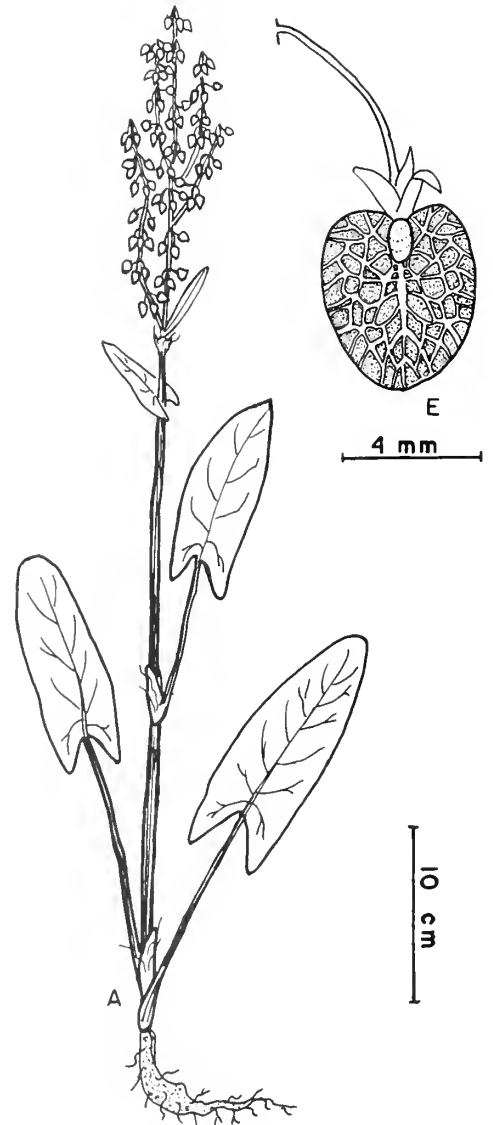
Type Description: Linnaeus, Species Pl., p. 337, 1753

Habitats: Waste places, fields, lawns and gardens (cultivated rarely)

Habit: Coarse, erect perennial

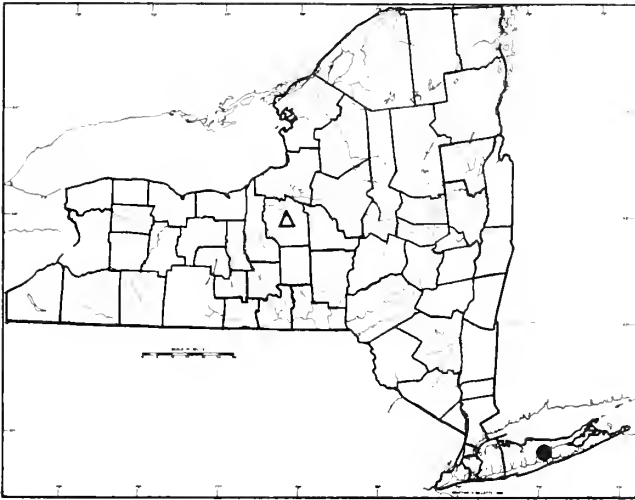
Flowering: May–September

General Distribution: Circumboreal adventive, in the United States south to Pennsylvania



Description: Plants dioecious; stigmas 3, fimbriate-branched from a flared base; styles 3, membranous, arched downward over the ovary apex; ovary 1, becoming a three-angled achene; achene dark reddish-brown with paler, acute angles, 2–2.5 mm. long, enclosed by the valves; inner perianth lobes ovate, becoming valves 4–6 mm. in length, veiny; only one valve usually developing a tubercle at maturity; outer sepals triangular-ovate, reflexed even before fruiting, about 1.5 mm. long; stamens 6; filaments short, anther sacs about equal to the perianth; bracts usually reduced, truncate, eciliate, sheathing; inflorescence a branched panicle of many distant to approximate, whorled fascicles; pedicels about equal in length to perianth in fruit; cauline leaves sagittate oblong to broadly lanceolate; lower leaves petioled, the upper ones almost sessile; basal leaves (when present) with deeply cordate to clasping bases, or sagittate with petioles; stipules scarious, disintegrating to fibers; nodes scarcely swollen, papillose or strigose; internodes stout, ribbed, stem 30–90 cm. tall, usually arising singly from a stout perennial root ($2n = 12 + XX$, female; $2n = 12 + XYY$, male; tetraploids also reported).

Importance: Once used more frequently in cooking, especially as a salad green or soup flavoring to lend a sour taste. Said to disagree with gouty persons due to acidity from oxalic acid. Reputed to lessen the appetite, aid indigestion and lessen fevers (folklore). Chopped leaves mixed with vinegar and sugar make green-sauce added to meat dishes. A decoction from the root gives a rich wine color to barley soup or makes a false wine for sick persons. Medicinally, it has been used for its astringent properties in mixtures for the treatment of cutaneous tumors and scrofulous deposits. It has also been used for ringworm, scurvy and as a gargle for sore throats.



3. *Rumex hastatulus* Baldw. ex Ell.

Common Names: Heart Sorrel, Wild Sorrel

Type Description: Baldwin in Elliott, Sketch. Bot. S.C. and Ga., p. 416, 1817

Synonym: *R. engelmannii* Meisn. (sometimes misspelled "hastulatus")

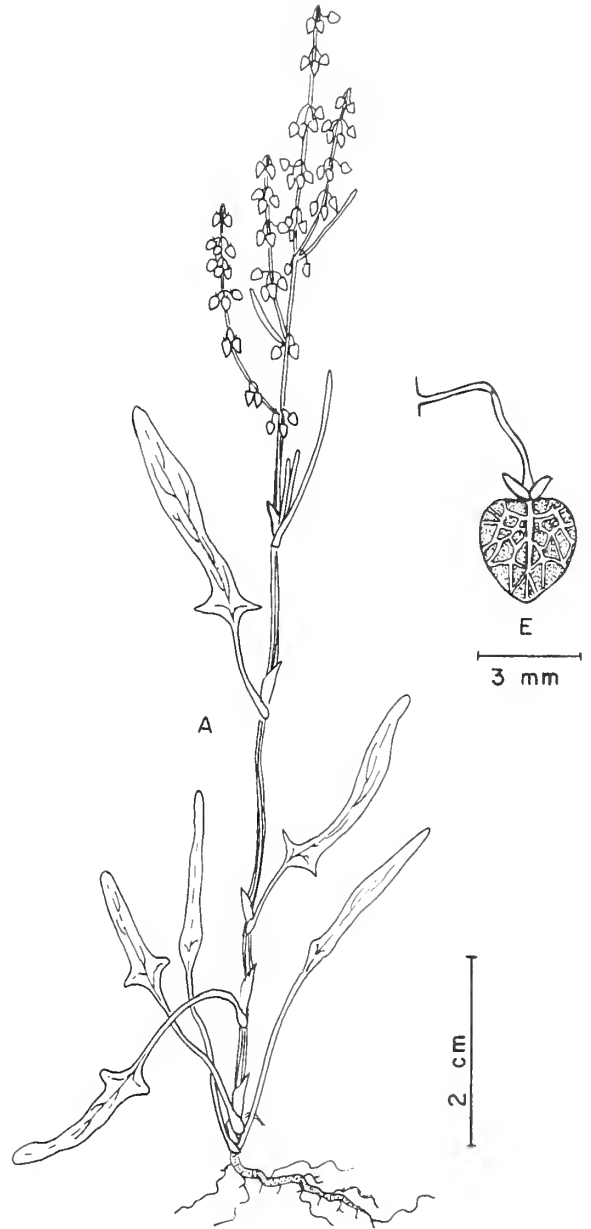
Origin: Native of Eastern United States

Habitats: Sandy to lateritic soils, open places and disturbed sites

Habit: Slender perennial

Flowering: May–August

General Distribution: Mostly in the Coastal Zone, Massachusetts to Texas and the Lower Mississippi Valley



Description: Plants dioecious; **stigmas** 3, stellate-fimbriate, **styles** 3, deflexed; single **ovary** 3-angled becoming a strongly 3-angled **achene**; achene yellowish-brown, translucent, with a distinct dark line at each angle, 0.9–1.2 (1.5) mm. long, 0.6–0.7 mm. wide, enclosed in fruit by the expanded **valves**; valves 2.5–3.5 mm. long in fruit, pale pinkish to yellow or suffused with purple, central nerve strong but not forming **tubercles**; **outer sepals** reflexed, about 1 mm. long; **stamens** 6: filaments short, anther sacs not equaling perianth in length, yellowish to reddish; **inflorescence** 10–30 cm. long, a narrow, slender panicle of fascicles; **bracts** reduced, scarious, hyaline to brownish; **pedicels** about the length of the perianth; **leaves** glabrous, smooth variable in shape, but lower ones usually with hastate lobes; **cauline leaves** short-petioled to sessile, usually unlobed or only slightly hastate; **basal leaves** 2–10 cm. long, terminal lobe lanceolate, acute to obtusely tipped, petioled; **nodes** slightly swollen; **internodes** elongate above basal cluster; **stem** usually unbranched from a slender, perennial **rootstock** which may simulate an annual **taproot** ($2n = 12 + XX$, female; $2n = 12 + XYY$ male).



4. *Rumex conglomeratus* Murray

Common Names: Green Dock, Clustered Dock

Type Description: Murray, Prod. Fl. Grott., p. 52, 1770

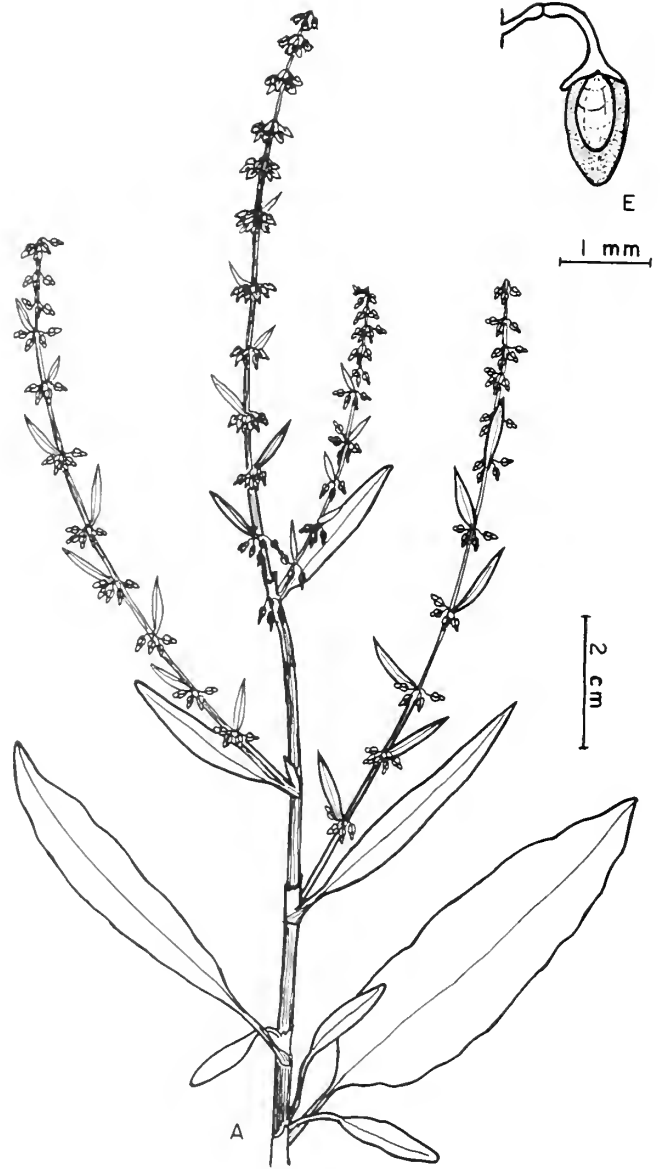
Origin: Europe

Habitats: Waste places, open shores, roadsides

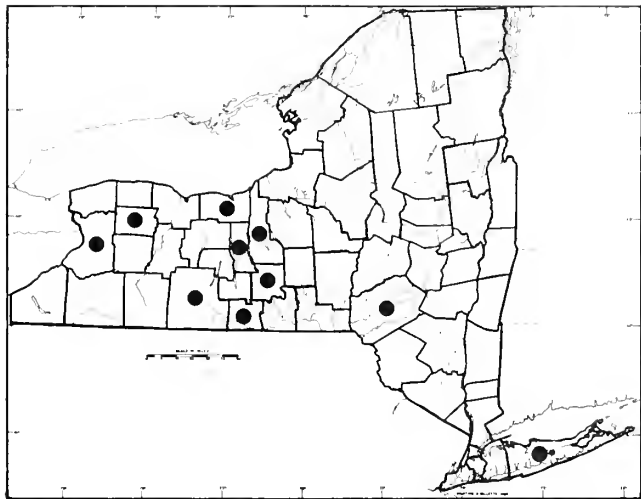
Habit: Coarse, perennial

Flowering: June–August

General Distribution: European and naturalized in extra-tropical New World



Description: Flowers bisexual (strongly protandrous); stigmas 3, stellate-fimbriate; styles 3, deflexed; ovary 1, becoming a 3-angled achene about 1.8 mm. long and 1.4 mm. wide; achene glossy, dark reddish-brown, with obtuse angles and a broad base; valves oblong to oblong-ovate, 2–3 mm. long, 1–1.5 mm. wide, barely exceeding or not exceeding the achene width; each valve with a tubercle which is plump and covers most of the valve width; outer perianth lobes appressed, ascending 1–1.5 mm. in length; stamens 6: filaments short, anther sacs yellowish, not exceeding the perianth; inflorescence a panicle of divergent or loosely ascending racemes of fascicles, subtended by leafy “braets” for at least half its length; pedicels short, stout, (1–2 mm.) equaling or shorter than the fruiting perianth; lower leaves oblong to oblong-lanceolate, 6–20 cm. long, with truncate to cordate bases; leaves not crisped; upper leaves narrower and shorter with cuneate bases; stems, 0.6–1 (1.5) m. tall, one to several from a stout, branched rootstock ($2n = 20$).



5. *Rumex maritimus* L.

Common Name: Golden Dock

Type Description: Linnaeus, Species Pl., p. 335, 1753

Synonyms: *R. persicarioides* L. *sensu* many American authors, *R. fueginus* Phil.

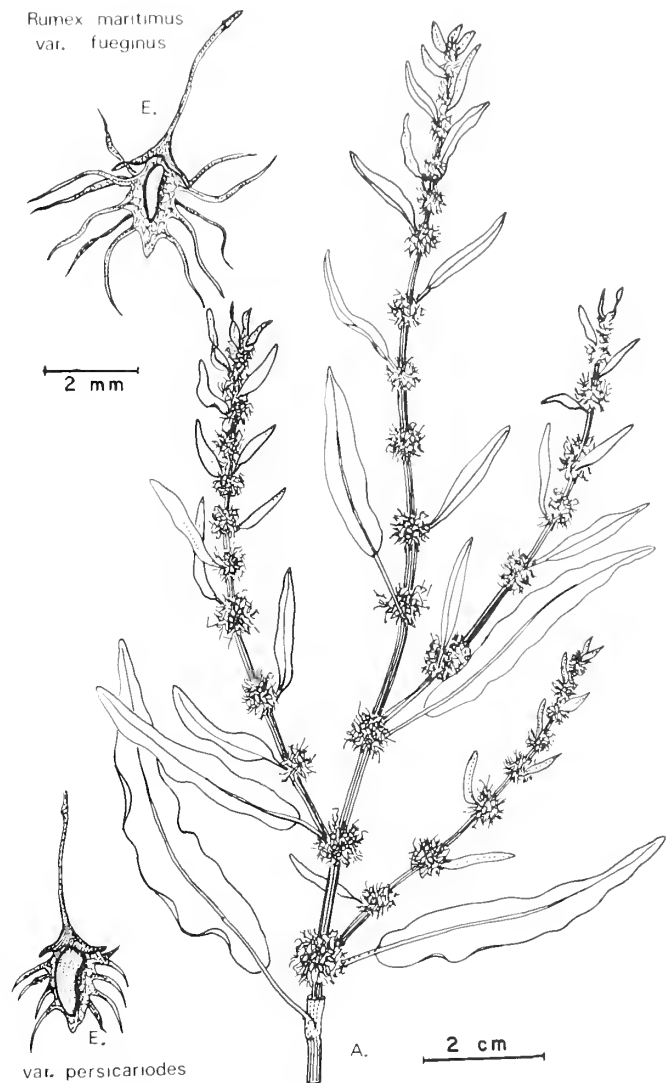
Origin: Uncertain

Habitats: Shorelines, strands, disturbed sites

Habit: Erect to sprawling annual or biennial

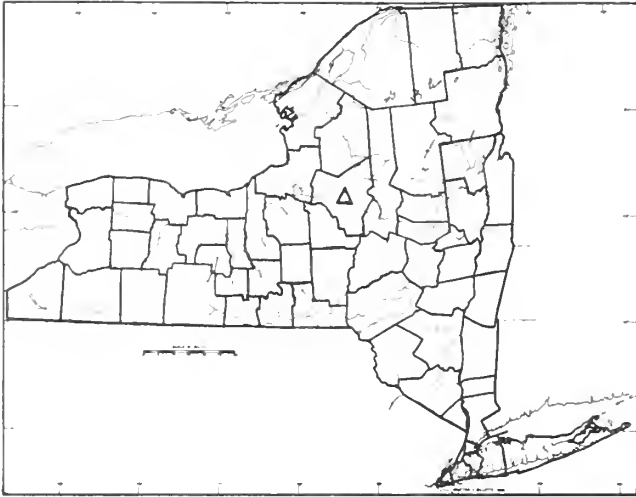
Flowering: July–September (New York)

General Distribution: East to west coasts of Canada and the United States, South America, Eurasia



Description: Plants with bisexual flowers, protandrous, **stigmas** 3, stellate-fimbriate with 3 deflexed styles; **ovary** 1, becoming a 3-angled **achene**; achene golden-brown or pale, elliptic in outline, 1–1.4 mm. long, with sharp angles, enclosed by the perianth in fruit; **stamens** 6; filaments short, anther sacs yellowish, not exceeding the perianth; **valves** greenish to golden or red-brown, reticulated, papery 2–2.5 mm. long; each **valve** with 4 to 6 spiny **teeth**, diverging 0.5–2.5 mm. beyond the fruit; all valves with prominent, paler **tubercles** which are lanceolate to plump-ellipsoid; **outer sepals** linear-lanceolate, ca. 1 mm. in length, somewhat recurved; **pedicels** slender, articulated near base and deflexed, 1–2 times perianth length; **inflorescences** of dense, globose clusters of fascicles, in the axils of leaves, appearing terminal in dwarf plants, becoming reddish-brown or golden in fruit, leafy braceate; **leaves** linear-lanceolate with acute to obtuse tips and usually truncated bases (may be slightly crisped or papillate) **upper leaves** lanceolate to elliptic, short petioled, similar to leafy bracts, linear in the upper inflorescence; **petioles** up to 4 cm. long on basal leaves; **stipules** scarious, disintegrating; **stems** hollow, erect to much-branched and sprawling; **nodes** scarcely swollen; **plants** 3–60 cm. tall from a fibrous root ($2n = 40$).

Note: This species is a member of the highly variable species complex called the Maritimi, which presents some perplexing nomenclatural problems. The only apparently consistent character separating *R. persicarioides* from *R. maritimus* is plumpness of the tubercles. To recognize these taxa as infraspecific to a single species requires subordination of one of these two Linnaean binomials, so this will be considered in a separate publication. Plants corresponding morphologically with *R. persicarioides* are found in New York on Long Island. The remainder of our materials are *R. maritimus* L. var. *fueginus* (Phil.) Dusen.



6. *Rumex pulcher* L.

Common Name: Fiddle Dock

Type Description: Linnaeus, Species Pl., p. 336, 1753

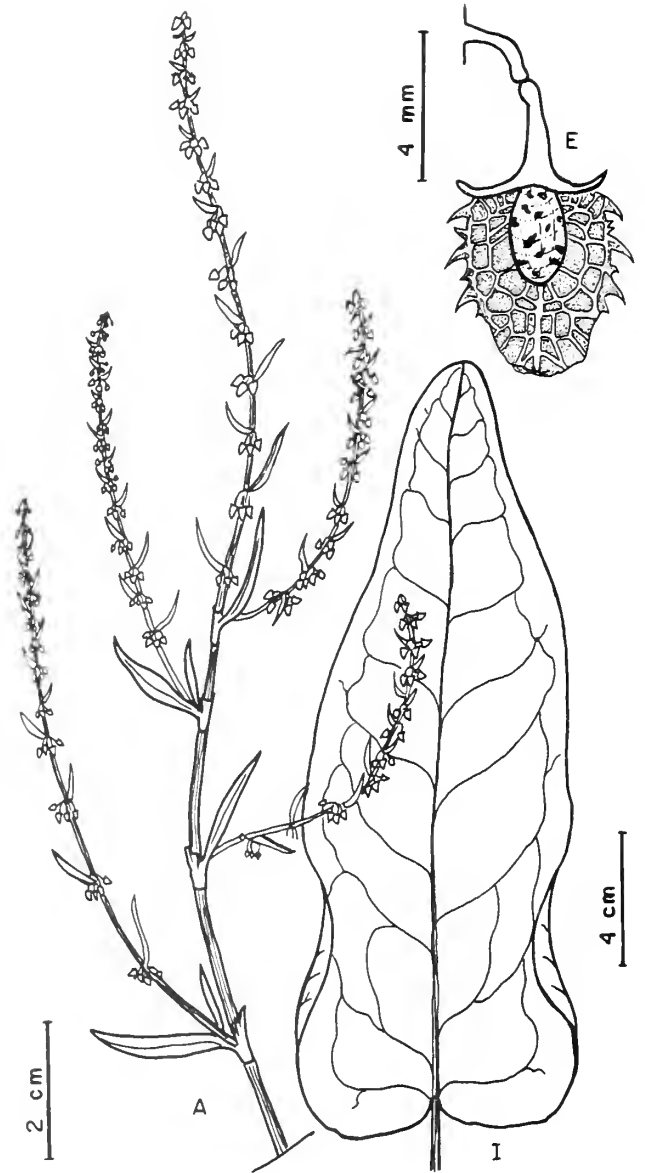
Origin: Mediterranean Basin

Habitats: Waste places and roadsides

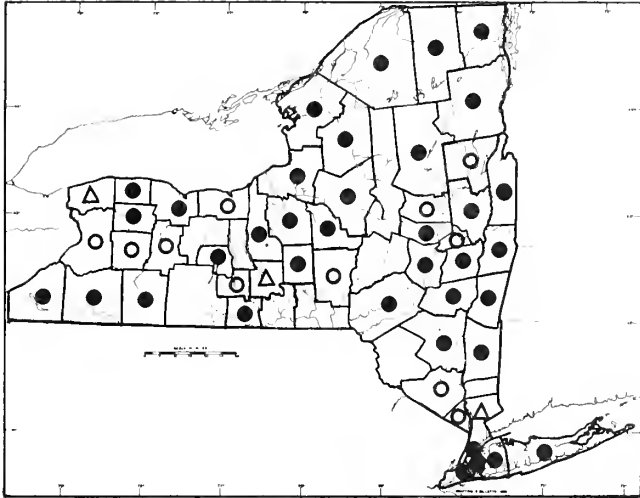
Habit: Tall, slender perennial with a large inflorescence

Flowering: May–July

General Distribution: Weedy on major continents



Description: Plants with bisexual, protandrous flowers; stigmas 3, stellate-fimbriate; styles 3, deflexed; ovary 1, becoming a 3-angled achene; achene dark reddish-brown, glossy, deltoid in outline, base broad, not stipitate, angles somewhat obtuse, 3–4 mm. long enclosed in fruit by the valves; stamens 6; filaments short, anther sacs yellowish, not exceeding the perianth; valves ovate-triangular, 4.5–6 mm. long, 2.5–4.5 mm. wide in fruit, strongly reticulated with 2–5 teeth per valve margin; all valves usually bearing tubercles; tubercles may be unequal in size at maturity, with coarse, warty surfaces; outer perianth parts 2–3 mm. long, ascending; inflorescence accounting for up to $\frac{3}{4}$ of the plant height with fascicle-clusters often forming tangled racemes; fascicles remote, not contiguous; pedicels thick, very short to almost the length of the perianth, articulated near the middle; lower leaves often fiddle-shaped, somewhat crisped, long petioled, 3–15 cm. in length, sometimes with a pubescence; upper leaves much reduced; stipules brownish, lacerate, but often persistent; nodes somewhat swollen; stems simple or branched at the base, ribbed, arising from a stout, perennial root; plants 40–85 cm. tall ($2n = 20$).



7. *Rumex obtusifolius* L.

Common Names: Bitter Dock, Red-veined Dock, Blunt-leaved Dock, Butter Dock

Type Description: Linnaeus, Species Pl., p. 335, 1753

Synonym: *Rumex crispatus* Michx.

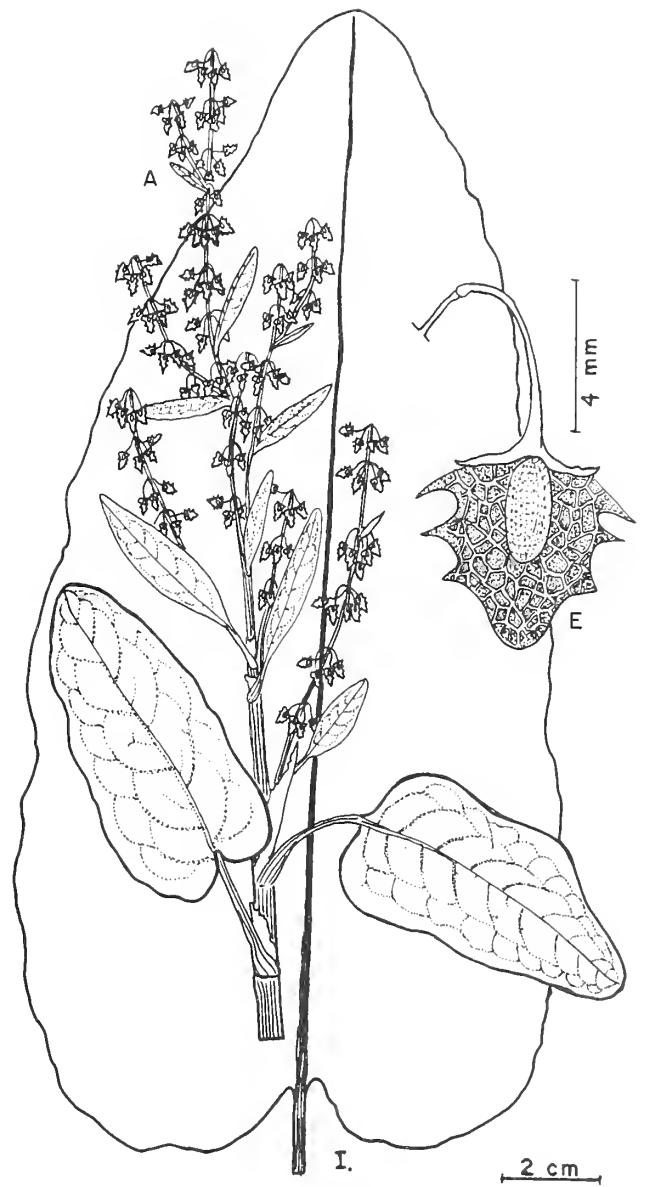
Origin: European

Habitats: Waste places, roadsides, pastures

Habit: Coarse, tall, erect perennial

Flowering: June–August

General Distribution: A more or less cosmopolitan weed



Description: Plants with bisexual, protandrous flowers; **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 3-angled **achene**; achene golden to mahogany or chocolate-brown, lustrous, uniformly colored, elliptic, 2.2–5 mm. long, not sharply angled; **stamens** 6; filaments short, anther sacs yellowish, shorter than the perianth parts; **valves** triangular-ovate, 4–6 mm. long in fruit, reticulately veined, each margin with 2–4 subulate teeth; one valve (2–3) with a prominent **tubercle** which is plump and finely reticulated; **outer sepals** oblong, narrow, 1.5–2 mm. long, usually not reflexed; **upper inflorescence** with scarious **bracts**; **lower inflorescence** with leafy bracts and some small, lanceolate leaves; **inflorescence** an elongate panicle of upright or divergent racemes of fascicled, slender-pedicelled flowers; **fascicles** remote below and more contiguous above; **pedicels** about 2–3 times the length of the fruiting perianth, jointed in the lower third, often near the base; **lower leaves** red-veined, long petioled, membranous and not crisped, 10–35 cm. long, 5–15 cm. wide, narrowly to broadly ovate, subcordate, apex rounded or blunt; **lower leaf surfaces** papillate with minutely puberulent veins; leaf margins crenulate; **upper leaves** oblong to lanceolate with acute apices and rounded bases; **nodes** slightly swollen; **stipules** brownish, often lacerate but persistent; **stem** stout ribbed, usually simple below the inflorescence, about 60–150 cm. tall, arising from a stout, perennial root ($2n = 50$).

Importance: This species has been used in the past in decoctions for scurvy and circulatory problems, outwardly applied as an astringent and to cure itching from nettle burns; it is a farm weed which harbors the Turnip Fly.



8. *Rumex verticillatus* L.

Common Names: Swamp Dock, Water Dock

Type Description: Linnaeus, Species Pl., p. 334, 1753

Origin: Eastern United States

Habitats: Wetlands, lakes, stream-sides

Habit: Erect, sparsely branched perennial

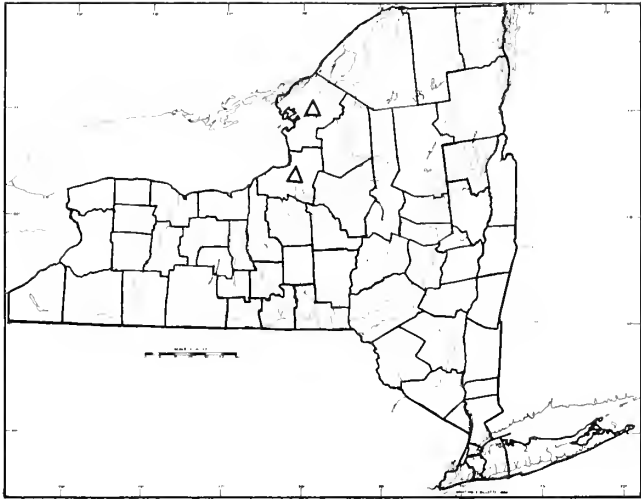
Flowering: June–September

General Distribution: Eastern and Central United States and Eastern Canada



Description: Plants monoecious (androgynous); **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 03-angled, brown achene; achene 2.8–3.1 mm. long, strongly stipitate, the angles dark, lined with hyaline margins; **stamens** 6; filaments short, anther sacs reddish, equaling the perianth; **valves** 3.5–5 mm. long in fruit, triangular-ovate, elongated near the apex, often heavily veined, margins entire, each valve with a **tubercle**; tubercles prominent, lanceolate to subulate, surface papillate, wrinkled, each grain with its base extending slightly below the base of the perianth, about $\frac{2}{3}$ the length of the valve; **outer sepals** oblanceolate, slender on female flowers, obovate and much like the inner perianth on male flowers; **bracts** reduced, dark-veined, hyaline, disintegrating to fibers; **inflorescence** an open panicle of ascending racemes of drooping flowers, leafless, 20–40 cm. long; **pedicels** sharply deflexed and jointed near the base, 10–15 mm. long (2–5 times the length of the perianth); **leaves** narrowly to broadly lanceolate, petioled, up to 40 cm. by 5 cm., flat, margins entire or nearly so; **petioles** spongy; **stipules** scarious or hyaline, disintegrating to brown fibers; **nodes** scarcely swollen; **stems** usually single, erect (sometimes decumbent at base) 40–150 cm. tall, from a stout, deeply penetrating perennial **root**; sometimes rooting adventitiously at the lower nodes ($2n = 60$).

Importance: Sometimes boiled as pot-greens, especially in the Southeastern United States; prepared much as the Giant Water Dock of Europe (*R. hydrolapathum* Huds.) with a double boiling, throwing away the first water.



9. *Rumex pallidus* Bigel.

Common Names: White Dock, Seabeach Dock

Type Description: Bigelow, Fl. Bost., Ed. 3, p. 153, 1840

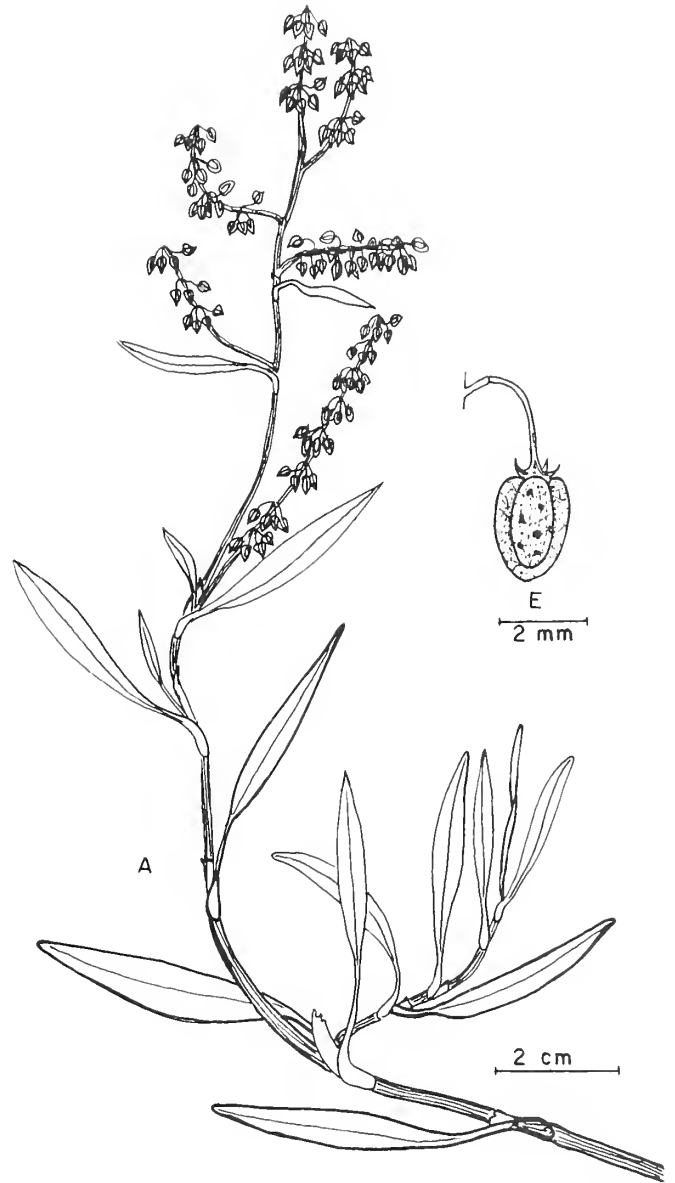
Origin: Native of Canada and Northeasternmost United States

Habitats: Shorelines, rocky and sandy coasts of salt and brackish waters and inland waterways

Habit: Erect or sprawling perennial

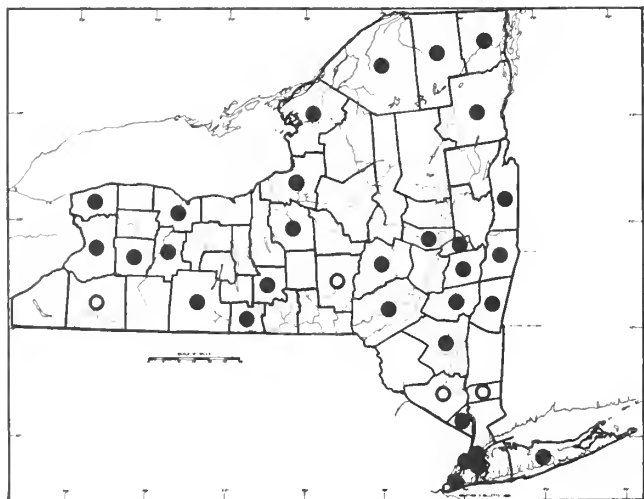
Flowering: June–August

General Distribution: Mostly coastal from Newfoundland south to New England



Description: Plants monoecious (androgynous); **stigmas** 3, stellate-branched; **styles** 3, short, deflexed; **ovary** 1, becoming a 3-angled **achene**; achene dark brown, strongly angled and slightly winged, about 2.5 mm. long, 1.1–1.2 mm. broad; **stamens** 6; filaments short, anther sacs yellowish not exceeding the perianth; **fruiting perianth** with deltoid-ovate valves, 3–4 mm. long, whitish to straw colored, with rounded bases and obtuse tips, margins entire, faces reticulately veined, and all valves with **tubercles**; tubercles large, ovoid-turgid, slightly pitted, yellowish to reddish with blunt tips, nearly as long as the valve and more than $\frac{1}{2}$ as wide; **female outer perianth** of lanceolate sepals, ca. 2 mm. long; **bracts** reduced to short, hyaline or reddish brown sheaths; **inflorescence** 10–20 cm. long, a panicle of widely divergent fascicled racemes; **pedicels** shorter than the fruiting perianth (2–4 mm. long), visibly jointed just above the base; **leaves** glabrous, glaucous, petioled, lateral veins inconspicuous, undersurface of leaves minutely papillate; **lower leaves** narrowly oblong to lanceolate, flat, 10–20 cm. long, 1.3–2.5 cm. wide, bases somewhat acute to long-cuneate; **upper leaves** narrower, short petioled; **petioles** glabrous, ribbed; **stipules** fragile; **nodes** slightly swollen; **stems** several from a common base or the lower axils, slender flexuous, procumbent to arcuate-ascending, slenderly ribbed, 30–70 cm. long, from a large, whitish, wooly, perennial **root** ($2n = 20$).

Note: All specimens seen to date from New York have been atypical, showing some degree of intermediacy with *R. triangulivalvis*.



10. *Rumex triangulivalvis* (Dans.) Rech. f.

Common Name: Willow-leaved Dock

Type Description: Fedde Rep. Sp. Nov. 40, p. 297, 1936

Synonyms: *R. mexicanus* Meissn. (in part), *R. salicifolius* Weinm. ssp. *triangulivalvis* Dans.

Origin: Native of Western United States, spreading as a weed

Habitats: Waste places, moist, often brackish soils

Habit: Erect perennial

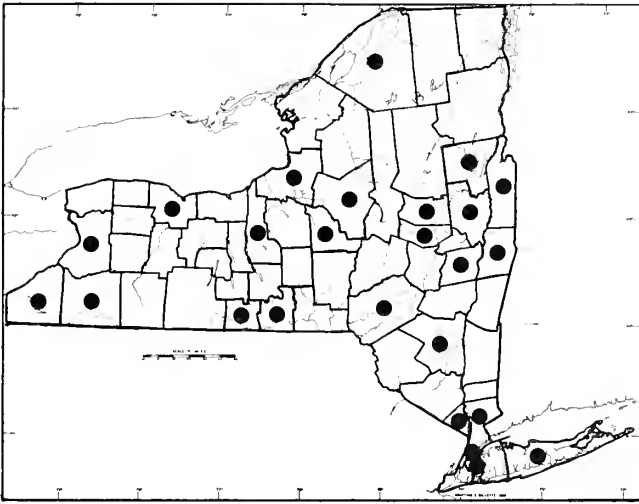
Flowering: June–August

General Distribution: Boreal North American from the west coast to Long Island



Description: Plants monoecious (androgynous); **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 3-angled **achene**; achene, dark brown to nearly black, ovoid, 2 mm. long by 1.3 mm. wide; **stamens** 6: filaments short, anther sacs shorter than perianth parts, yellowish; **valves** about 3 mm. long, 2.5–3 mm. wide, triangular-deltoid with subcordate bases, margins entire to denticulate or irregularly crenulate, valve face olive to reddish-brown, reticulate veined, all valves usually with equal tubercle development; **tubercles** plump, bases rounded, tips acute, 1.8–2.5 mm. long; **outer sepals** about 1.5 mm. long, not reflexed; **inflorescence** 10–30 cm. long, a panicle of fascicled racemes of slender-pediceled flowers; racemes often subtended by linear leaves; **pedicel** longer than the perianth, articulated near the base; **leaves** mostly cauline, though larger near the base, pale green, narrowly lanceolate, flat (rarely undulated); **lower leaves** 12–15 cm. long, about 2–3 cm. wide; **upper leaves** much reduced in size with shorter petioles or sessile; **stipules** whitish to pale brown, soon dropping; **nodes** slightly swollen; **stem** freely branched in the lower axils, 20–60 cm. tall, brownish-purple, ascending to erect from a stout, perennial **root** ($2n = 20$).

Intraspecific Variability: This species complex has produced problems for the systematist; plants are quite variable in perianth size and other characters. Long known as *R. mexicanus* Meissn., these plants range widely from Mexico to Canada in the western part of the continent, then across to the Northeastern United States. Typical *R. salicifolius* is a closely related species with small perianth size and western distribution. Western populations with large perianths have been reported as tetraploid, while widespread *R. triangulivalvis* is diploid. Hybridization studies (Sarkar, 1958) indicate extremely high fertility, at least to the F_1 , within this species complex. *Rumex palidus* is no doubt also involved, as it appears to be the eastern counterpart of *R. salicifolius*.



11. *Rumex altissimus* Wood

Common Names: Pale Dock, Tall Dock, Peach-leaved Dock

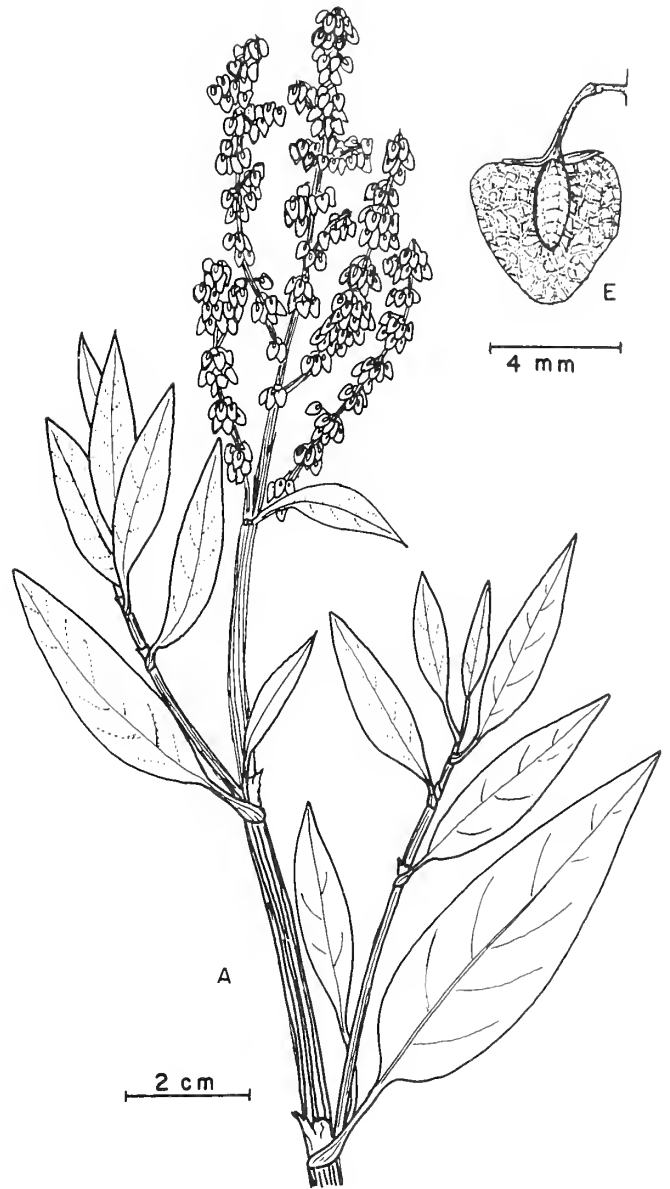
Type Description: Wood, Classbook Bot. Ed. 2, p. 477, 1847

Origin: Native, Eastern United States

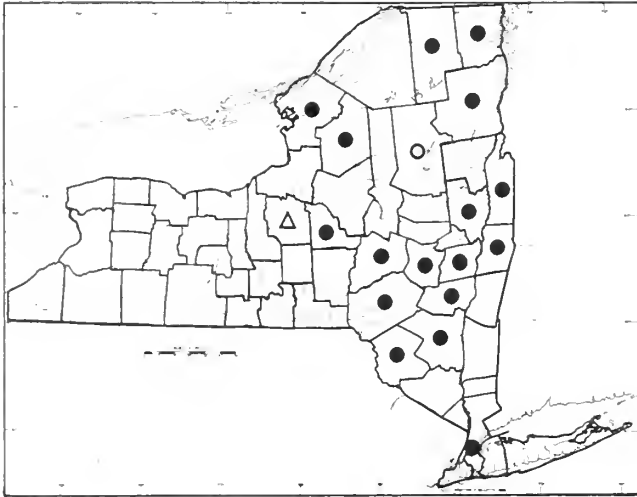
Habitats: Rich, often alluvial soils, stream and swamp margins

Habit: Branched, erect or ascending from a procumbent, perennial base

General Distribution: United States, mostly east of the Rockies; introduced into Europe



Description: Plants monoecious (androgynous); **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 3-angled **achene**; achene strongly angled to somewhat winged, dark brown, ca. 3 mm. long; **stamens** 6: filaments short, anther sacs about equal in length to the perianth; **valves** acute to obtuse tipped, truncated or cordate at the base, with entire margins and reticulated surfaces, olive to reddish-brown in color; usually only one valve with a tubercle; **tubercle** ovate-fusiform, prominent, wrinkled or smooth; **bracts** reduced to small, lacerate, reflexed to hyaline sheaths; **inflorescence** a panicle of dense, upright, spikelike racemes of whorled fascicles, about 5–35 cm. long, leafless or nearly so; **pedicels** jointed, shorter than the perianth in fruit; **leaves** ovate to oblong-lanceolate, 7–15 cm. long, short petioled; **stipules** prominent, chartaceous, lacerate; **nodes** barely swollen; **stems** strongly ribbed, reddish-brown (including petiole bases) 50 cm. to a meter tall from a tough, perennial **root** ($2n = 20$).



12. *Rumex longifolius* DC.

Common Name: Yard Dock

Type Description: DeCandolle, in Fl. Fr. Suppl., p. 368, Lambert and DC., 1815

Synonym: *Rumex domesticus* Hartm.

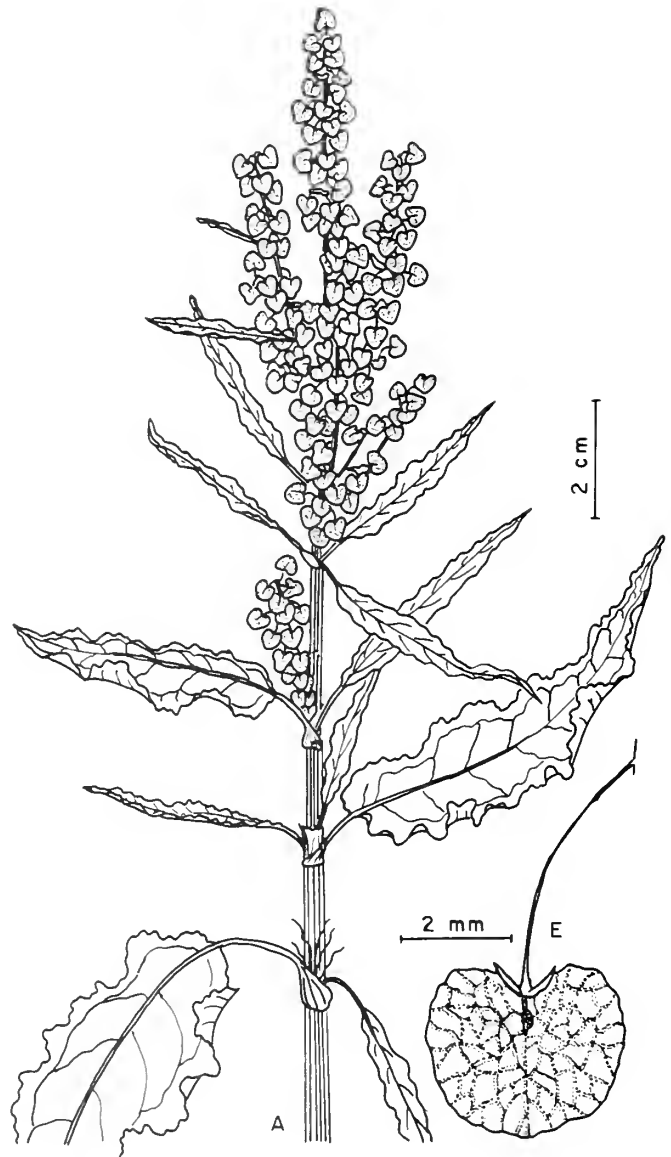
Origin: Northern Europe

Habit: Coarse, erect perennial

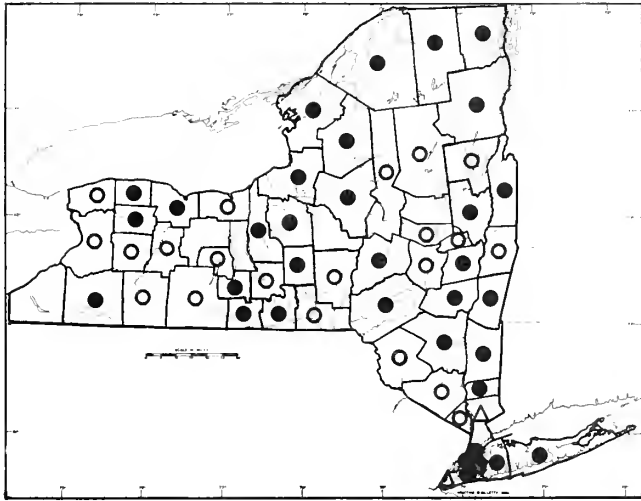
Habitat: Disturbed sites

Flowering: Late June–October

General Distribution: Circumboreal



Description: Plants with bisexual (protandrous) flowers; **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 3-angled achene; achene dark brown, 2.3–3 mm. long, smooth-shiny, base stipitate, apex acute; **stamens** 6; filaments short, anther sacs yellowish, dehiscing longitudinally, shorter than perianth; **valves** reniform-ovate, definitely as broad as, or broader than long, often cordate, 4–7 mm. long, strongly reticulate-veined with entire or minutely crenulate margins; usually all valves **without tubercles**, occasionally one with a small poorly developed globular grain; **outer sepals** about 1.5 mm. long, not reflexed; **inflorescence** an elongate panicle of erect, dense racemes of tightly whorled flowers, leafy **bracteate** to near middle; **pedicels** slender, flexuous, jointed well below middle, up to 2.4 times as long as the valves; **leaves** crisped, undulate or flat; **lower leaves** narrowly oblong, oblong-ovate, oblong-lanceolate, up to 80 cm. long, widest near the middle, 3–5 times as long as broad, base acute, squared or rounded; **petioles** long, ribbed, somewhat ligulate; **upper leaves** narrower, shorter petioled, mostly with cuneate bases; **nodes** slightly swollen, with **stipules** which disintegrate to fibers with age; **stem** ribbed, simple below inflorescence, 20–150 cm. tall; **taproot** long, simple, perennial ($2n = 40, 60$).



13. *Rumex crispus* L.

Common Names: Curly Dock, Yellow Dock, Sour Dock

Type Description: Linnaeus, Species Pl., p. 335, 1753

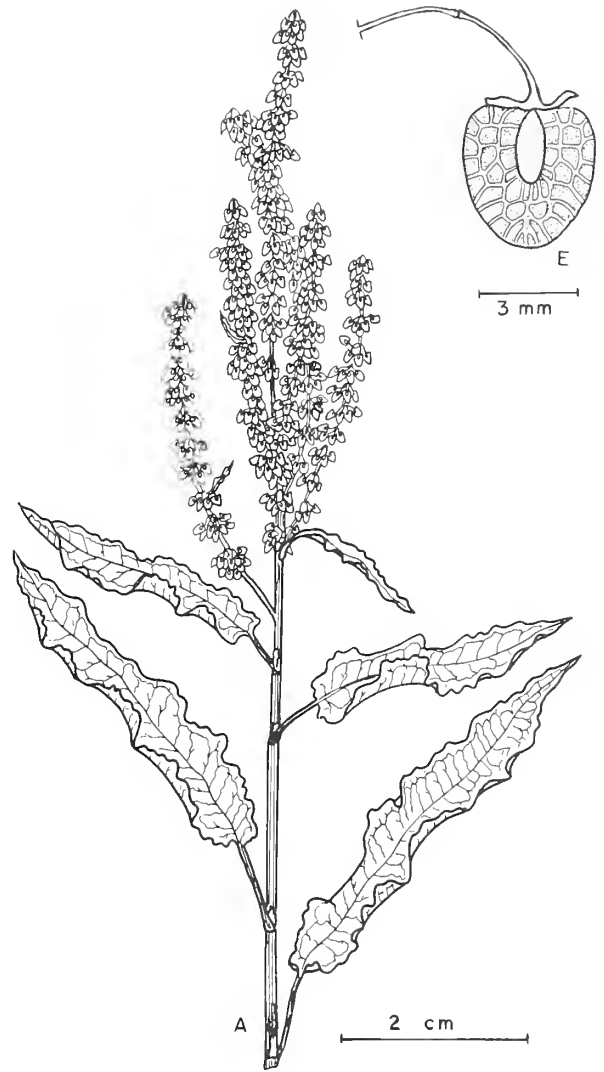
Origin: Eurasia

Habitats: Disturbed soil, waste places, roadside ditches

Habit: Coarse, erect perennial with strongly crisped leaves

Flowering: May–September

General Distribution: Cosmopolitan weed



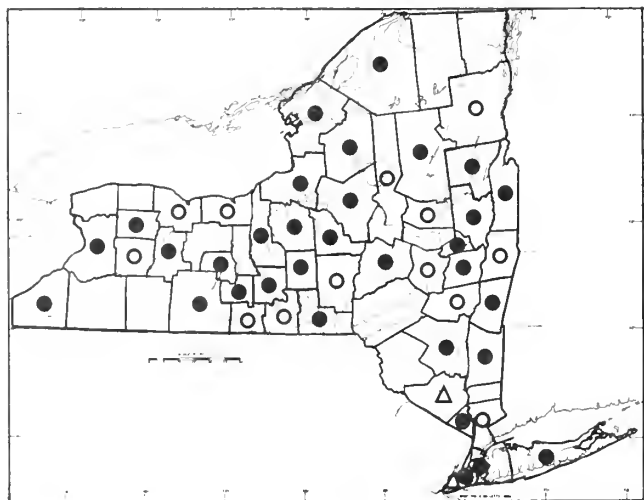
Description: Plants with bisexual (protandrous) flowers; **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 3-angled **achene**; achene reddish-brown, 2–2.5 cm. long, smooth-shiny, slightly stipitate, tapering to a short, pointed apex; **stamens** 6; filaments short, anther sacs yellowish, dehiscing longitudinally, shorter than the perianth; **valves** broadly ovate to slightly deltoid; 4–5 mm. long and about as wide, reticulate with entire or minutely erose margins; usually all 3 valves with **tubercles**, occasionally only one; grain size sometimes unequal, the largest tubercle elliptic, turgid, pitted, $\frac{1}{2}$ the length of the valve; **outer sepals** about 1.5 mm. long, not reflexed; **inflorescence** an elongate panicle of dense, slender racemes of tightly whorled flowers, leafy bracteate to near middle; **pedicels** slender, flexuous, jointed just below the middle, 5–10 mm. long; **leaves** with strongly crisped margins; **lower leaves** 10–30 cm. long, base cuneate to subcordate, their **petioles** long, often pubescent, ribbed on upper surface; **upper leaves** smaller, narrower, with obtuse bases for the most part; **nodes** slightly swollen, with **stipules** that disintegrate with age; **stems** ribbed, simple below the inflorescence, 30–160 cm. tall; **roots** 6–20 cm. long, brownish with pale interior, usually unbranched, perennial ($2n = 60$).

Intraspecific Variation and Hybridization: Two hybrids are reported from New York locations:

- 1) *Rumex crispus* X *obtusifolius* is recognized by its obvious teeth on the margins of the valves of the fruiting perianth; this hybrid has been reported only occasionally (probably a pentaploid).
- 2) *Rumex crispus* X *patientia* is intermediate in valve size between the two species, making the valve to tubercle-length ratio higher; the fruits are larger than those of *R. crispus*, but the leaves are variously crisped and undulated.

Importance: *Rumex crispus* has been used occasionally as a pot-green with double and triple boiling and decanting; however, its main use has been medicinal; the root contains rumicin and chrysarobin, and is usually boiled down to

a syrup; the syrup can be dried and encapsulated or taken in solutions of various kinds; the extract has astringent properties, being applied or taken internally for various kinds of bleeding, including lung conditions and hemorrhoids; it is variously prescribed in Europe for jaundice, bilious complaints and as a laxative; tinctures from the flowers and seeds are taken for throat roughness, and variously applied to the body to relieve itching of skin conditions; it has even been used in the treatment of cancer and diphtheria cases, where it is said to delay the enfeebled condition. As in many cases of popular folk medicine, most of these claims should be carefully scrutinized.



14. *Rumex orbiculatus* Gray

Common Name: Great Water Dock

Type Description: Gray's Man. Bot. Ed. 5, p. 420, 1867

Synonyms: *R. britannica* L. *R. hydrolapathum* var. *americanum* Gray

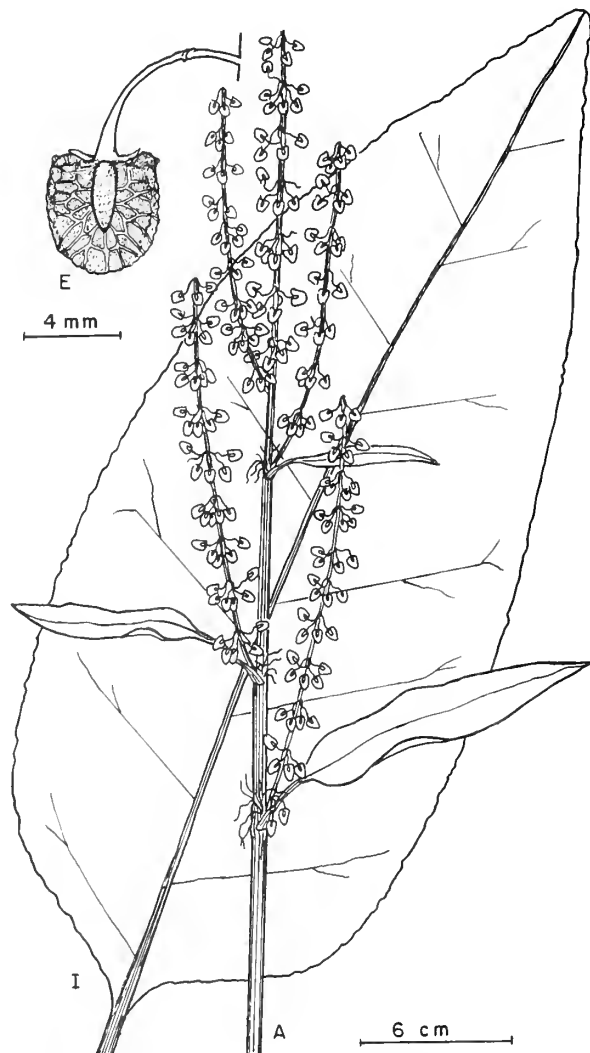
Origin: United States and Canada

Habitats: Swamps, wetlands and meadows

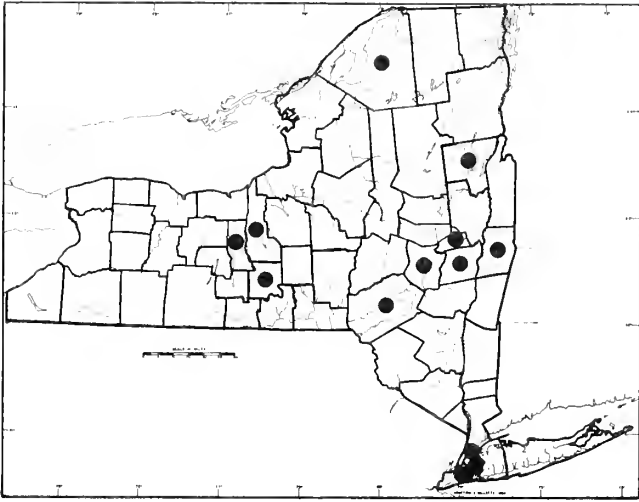
Habit: Large, coarse, erect perennial

Flowering: June–September

General Distribution: Wet lowlands of Newfoundland south to Ohio and west to Nebraska



Description: Plants monoecious (androgynous); **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 3-angled achene; achene brown, strongly 3-angled to slightly winged, ± 3.5 mm. long, stipitate at base; **stamens** 6: filaments short, anther sacs yellowish to reddish, slightly shorter than perianth segments; **valves** orbicular in fruit, 5–7 mm. long, 4.5–7 mm. wide, reddish brown, rigidly membranous with prominent reticulations, base truncated, apex rounded to obtuse, margins more or less entire or rarely with a few small teeth; each valve with a **tubercle** which is narrowly lanceolate, wrinkled on the sides and about $\frac{1}{2}$ as long as the valves; **outer sepals** (female) 2–2.5 mm. long, lance-ovate; **bracts** reduced to scarious sheaths which disintegrate to fibers; **inflorescence** an elongate panicle; **pedicels** slender 6–9 mm. long, jointed in the lower fourth near the base (obscurely); **leaves** glabrous, slightly leathery, variable in size and shape at different positions on the plant, mostly oblong-lanceolate, up to 50 cm. long, bases usually truncated and tips obtuse to acute; **middle and upper leaves** narrower, linear toward the inflorescence; **leaf margins** minutely irregular to crenulate, flat, undulate or crisped; **midribs and petioles** often ribbed and reddish or purplish; **base of petiole** strongly clasping the stem; **stipules** large, brownish, disintegrating into dark fibers; **nodes** somewhat swollen; **stem** stout, rigid, usually ribbed, up to 2.5 m. in height, often inundated at base, arising from a stout, yellowish root with thick lateral branches ($2n = 60$).



15. *Rumex patientia* L.

Common Names: Patience, Monk's Rhubarb, Passion Dock, Patience Dock

Type Description: Linnaeus, Species Pl., p. 333, 1753

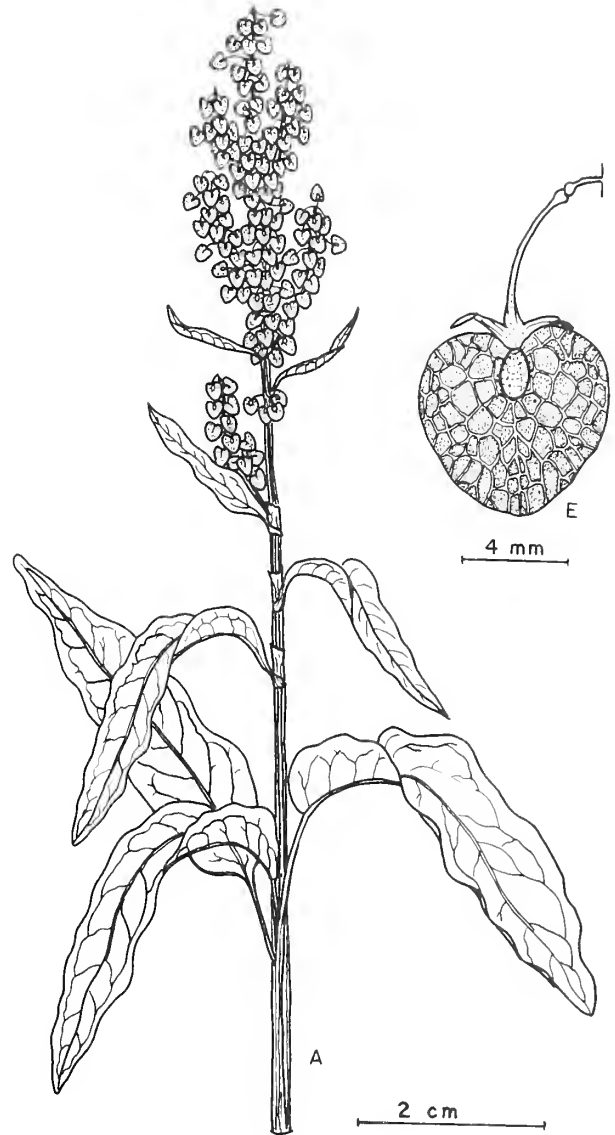
Origin: Southeastern Europe and Asia

Habitats: Waste places, roadsides

Habit: Robust, sometimes very tall, erect perennial

Flowering: May–August

General Distribution: Northeastern United States and Canada to the Midwest (naturalized)



Description: Plants with bisexual flowers (protandrous); **stigmas** 3, stellate-fimbriate; **styles** 3, deflexed; **ovary** 1, becoming a 3-angled **achene**; achene dark reddish brown, broadest slightly below the middle, base slightly stipitate, ca. 3 mm. long; **stamens** 6: filaments short, anther sacs yellowish, shorter than the lobes of the perianth; **valves** broadly rounded, 5–9 (10) mm. long, reddish to brown at maturity, with minutely denticulate margins, usually only one valve bearing a small **tubercle**; tubercle $\frac{1}{3}$ the length of the valve or less; **outer sepals** 1.5–2.0 mm. long, reflexed in fruit; **pedicels** slender, jointed below the middle, 5–10 mm. long; **bracts** scarious, sheathing; **inflorescence** a stout, elongate panicle with ascending branches of fascicles, 25–70 (90) cm. long, with some small leaves; **leaves** glabrous, pale green, broadest below the middle, up to 35 cm. long by 15 cm. wide, margins only undulating or slightly crisped (except in hybrids); **lower leaves** ovate-oblong to oblong-lanceolate with truncate bases; **petioles** flat on upper side; **stipules** brownish to hyaline, becoming lacerated; **nodes** somewhat swollen; **stems** very stout, ribbed, usually unbranched below the inflorescence, up to 3 m. tall, usually arising from a single stout perennial root ($2n = 60$).

Infraspecific Variation: Known to hybridize with Curly Dock (See under *R. crispus*)

Importance: Like many Docks it has been used for its astringent properties as a treatment for bleeding and as a mild laxative; it is boiled with one or two decantings of the pot water and eaten as a green vegetable.

Note: *Rumex sanguineus* L. is reported by House (1924) and others as a waif. Specimens have not been seen which verify its establishment in the State. Young plants of *R. obtusifolius* often have bright red veins, and these are sometimes mistaken for *R. sanguineus*.

3. POLYGONUM

Common Names: Knotweed, Smartweed, Bindweed, Tearthumb

A genus with worldwide distribution in wetlands and disturbed soils. There are over 30 native and introduced species in New York, representing seven major subgenera. The plants are mostly herbaceous annuals or perennials; some species are vines or subshrubs, reaching a height of 4 m.

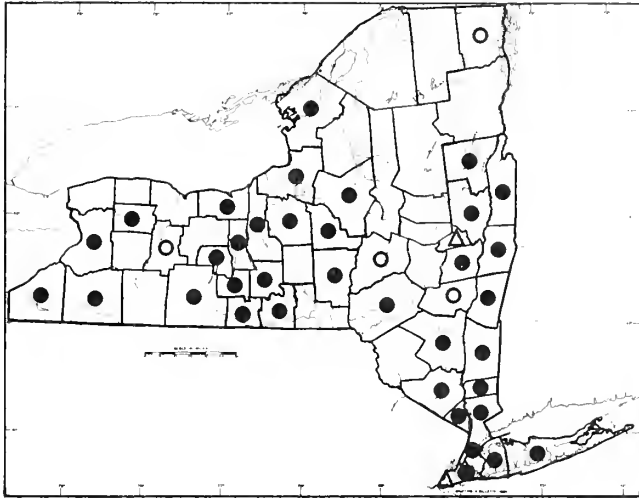
Description: Flowers bisexual or functionally unisexual (cleistogamous to mechanically heterostyled); **plants** totally bisexual, dioecious or polygamous; **stigmas** capitate, 2–3 at style tips or sessile; **styles** 2–3, separate, fused or obsolete; **ovary** unilocular, 2–3 angled, with a single orthotropous **ovule** in one of its angles; **placentation** basal; **fruit** an **achene**, 2–3 (4) angled or turgidly lenticular, acute to obtuse at the apex, acute to obtuse at the base, sometimes stipitate, yellow-green to brown to black, surface pebbly to highly glossy; achene enclosed or exerted from the persistent perianth; **seed** conforming to the achene shape in fruit; **embryo** in a groove, curving around the mealy to albuminous **endosperm** in one angle of the fruit; **stamens** 3–9, sometimes associated with a basal **glandular disc**; **filaments** linear or in the inner ones dilated, **anther sacs** greenish, yellow to red-purple dehiscent by longitudinal slits; **perianth** petaloid, deeply or shallowly 4–5 lobed, with a somewhat connate base; **outer lobes** usually enclosing the inner in fruit, with cucullate tips in many native species, greenish to white, pink, red or red-purple, midvein obscure to prominent, or rarely expanded into a wing in fruit; **inner lobes** similar in color and shape, subequal or reduced; **pedicels** included in bracts or exerted (rarely deflexed), 2 or more joined alternately on short peduncles to form fascicles; **fascicles** borne in the axils of sheathing; **bracts** (ocreae) obtuse to truncate, tubular sheathing with entire or ciliate margins, overlapping or remote; **inflorescences** of simple fascicles scattered on the plant, or more often organized into panicles which simulate spikes, racemes and capitate heads; **leaves** simple, alternate, entire (rarely crenulate) with a wide range of shapes from cordate to linear, glabrous to copiously pubescent or glandular, with **petioles** which may reach many cm. in length, or sessile and jointed to the **stipules**; stipules two-lobed or tubular and sheathing (ocreae), often shattering with age, leaving a fibrous residue, glabrous to coarsely pubescent or glandular; some species with a flange or ring of bristles at the upper stipule margin; stipules joined to the petioles at or above the node level; **nodes** often swollen; **internodes** smooth to fluted, variously glabrous to pubescent or glandular (including so-called “peduncles” in the inflorescence); **stems** green or pink to brownish-red or orange, creeping, spreading or erect to vining or sprawling in water, arising from annual, biennial or perennial **taproots** or from creeping **rhizomes** or **stolons**.

KEY TO SPECIES OF POLYGONUM

1. Stems prickly with spines or hooked barbs(2)
1. Stems not prickly (stipules may have bristles).....(3)
 2. Leaves hastate; flowers in small racemes; achene lens-shaped1. *P. arifolium* (p. 23)
 2. Leaves sagittate; flowers in capitate heads; achenes 3-angled2. *P. sagittatum* (p. 24)
3. Outer perianth winged or keeled in fruit; vines or robust subshrubs(4)
3. Outer perianth not winged or strongly keeled in fruit; annual or perennial herbs.....(8)
 4. Plants viney, twining or sprawling; erect only when young or depauperate.....(6)
 4. Plants tall and erect or ascending (up to 3 m.)(5)
5. Leaves truncate at the base, abruptly acuminate at the tips, mostly 5–10 cm. long.....3. *P. cuspidatum* (p. 25)
5. Leaves cordate at the base, more tapered at the tip, mostly 12–20 cm. in length.....4. *P. sachalinense* (p. 26)
 6. Perianth lobes merely keeled, not strongly winged in fruit.....(7)
 6. Perianth lobes strongly winged.....5. *P. scandens* (p. 27)
7. Reflexed bristles present at the base of the stipules; styles not united6. *P. cilinode* (p. 29)
7. Reflexed bristles absent; styles united7. *P. convolvulus* (p. 30)
 8. Flowers mostly drooping in fruit on deflexed pedicels; spikes slender and much interrupted.....(9)
 8. Flowers mostly erect or ascending; inflorescences various.....(10)
9. Styles 2, rigid, persistent and elongated with hooks at the tips; lower leaves 5–15 cm. long8. *P. virginianum* (p. 31)
9. Styles 3, soon deciduous; leaves less than 5 cm. long9. *P. douglasii* (p. 32)

10. Leaves with two obvious longitudinal folds (plicate) on the narrowly lanceolate blades...10. *P. tenue* (p. 33)
10. Leaves not plicate.....(11)
11. Flowers in spike-like panicles or capitate heads; inflorescence not leafy; pedicels smoothly joined to the tubular stipules, not jointed at the leaf bases(24)
11. Flowers in small fascicles, often scattered, and subtended by leaves or foliaceous bracts; leaves jointed to the stem at the base of the stipules which are oblique and usually early shattering(12)
12. Tips on the perianth lobes longer than the achene in most flowers, enclosing the achene at maturity....(19)
12. Tips of the perianth equal to the achene length or shorter, not enclosing it completely.....(13)
13. Plants conspicuously heterophyllous; flowers crowded among the smaller leaves and bracts near the branch tips(14)
13. Plants not obviously heterophyllous; the subequal leaves grading in size through the season; flower clusters generally scattered throughout(15)
14. Many achenes conspicuously exerted, pale brown to greenish and smooth; plants erect to procumbent....
.....11. *P. ramosissimum* (p. 34)
14. Most achenes not conspicuously exerted, pebbly brown; plants wiry, sprawling12. *P. aviculare* (p. 36)
15. Plants distinctly glaucous; stipules persistent, silvery-membranaceous above, conspicuous, up to 1 cm. long....
.....13. *P. glaucum* (p. 37)
15. Plants only slightly glaucous (or mildewed); stipules not persistent or conspicuous, soon shattering(16)
16. Leaves ovate to elongate-elliptic, mostly 2–4 times as long as broad(17)
16. Leaves 5–9 times longer than broad, oblanceolate to lance-linear.....(18)
17. Outer perianth lobes elongate, curved, with boat-shaped (cucullate) tips, often slightly keeled; perianth about 3.5 mm. long at maturity, parted above the middle.....14. *P. achoreum* (p. 38)
17. Outer perianth lobes flat or flared, not curved-cucullate, without a keel; perianth generally less than 3.0 mm. long (excluding the achene), parted to about the middle.....15. *P. arenastrum* (p. 39)
18. Leaves oblanceolate with rounded tips; plants branching profusely (natives; often in salt marshes)
.....15. *P. ramosissimum* (p. 34)
18. Leaves lanceolate to linear with acuminate tips (sometimes minutely blunted), not rounded; lateral branching less profuse (weeds of fields and roadsides).....16. *P. neglectum* (p. 40)
19. Outer perianth lobes boat-shaped (with cucullate tips)(21)
19. Outer perianth lobes not cucullate(20)
20. Plants markedly heterophyllous; perianth divided to below the middle; achenes with 2–3 concave sides; plants spreading.....12. *P. aviculare* (p. 36)
20. Plants with subequal leaves; perianth not divided below the middle; achenes usually with one sharply concave and two convex sides; plants often forming cespitose mats on gravel and streets
.....15. *P. arenastrum* (p. 39)
21. Leaves lanceolate, oblanceolate or linear, 4–12 times longer than broad11. *P. ramosissimum* (p. 34)
21. Leaves oblong, oval or obovate, 2–3 times longer than broad.....(22)
22. Plants strongly heterophyllous (except the very young); erect with ascending branches.....
.....17. *P. erectum* (p. 41)
22. Plants with subequal leaves throughout; erect when young, but sprawling and mat-forming with age....(23)
23. Perianth parted to below the middle; not strongly constricted above the achene.....18. *P. buxiforme* (p. 42)
23. Perianth parted less than halfway, constricted to form a neck above the achene14. *P. achoreum* (p. 38)
24. Leaf blades extending down the petioles to form wings which clasp the stem at their bases.....
.....19. *P. nepalense* (p. 43)
24. Leaf blades not extending down the petioles(25)
25. Tubular stipules of the middle and upper leaves with a distinct ring of marginal bristles(28)
25. Tubular stipules entire or shattering, without marginal bristles, though their surfaces may be quite pubescent.....(26)
26. Perennials with horizontal rhizomes or aquatic stolons; inflorescences usually solitary (or paired) at the apex of each major branch.....20. *P. amphibium* (p. 44)
26. Annuals with taproots; inflorescences two, or usually more, per apex(27)

- 27. Perianth with conspicuous, raised veins shaped like inverted anchors; perianth lobes usually 4; inflorescences 1 cm. thick or less, sometimes nodding, greenish to pink-tinged21. *P. lapathifolium* (p. 46)
- 27. Perianth without raised, anchor-shaped veins; perianth lobes 5; inflorescences usually 1 cm. or broader, not nodding, pink to rose (rarely greenish)22. *P. pensylvanicum* (p. 47)
 - 28. Perennial plants with horizontal rhizomes or stolons.....(33)
 - 28. Annual plants with taproots(29)
- 29. Flowers with small yellow or brown glandular dots (visible with a hand lens and more pronounced after drying).....23. *P. hydropiper* (p. 48)
- 29. Flowers without glandular dots.....(30)
 - 30. Leaves broadly ovate to cordate, mostly 5–10 cm. broad24. *P. orientale* (p. 49)
 - 30. Leaves ovate-lanceolate to linear, usually less than 5 cm. wide.....(31)
- 31. Peduncles and upper stem covered with stalked glands25. *P. careyi* (p. 50)
- 31. Peduncles and upper stems without stalked glands(32)
 - 32. Bristles of the inflorescence bracts 2–3.5 mm. long, often equaling or exceeding the flower tips26. *P. cespitosum* (p. 51)
 - 32. Bristles of the inflorescence bracts short or lacking27. *P. persicaria* (p. 52)
- 33. Flowers with yellow to brown glandular dots that are numerous and randomly spaced (visible with a hand lens and more obvious after drying).....(37)
- 33. Flowers without glands, or with a few scattered, pale, flat structures.....(34)
 - 34. Achenes 3-angled; inflorescences several per main branch(35)
 - 34. Achenes lens-shaped; inflorescences solitary (or paired) on the major shoots.....20. *P. amphibium* (p. 44)
- 35. Fruiting perianth spherical in outline, the lobes incurved toward the slightly exerted achene28. *P. opelousanum* (p. 53)
- 35. Fruiting perianth oval in outline, enclosing the achene completely at maturity(36)
 - 36. Flowers greenish-white to creamy tan; plants robust29. *P. setaceum* (p. 54)
 - 36. Flowers pink to rose (albinos rare); plants slender30. *P. hydropiperoides* (p. 55)
- 37. Inflorescences continuous with more or less overlapping eciliate bracts and flowers; robust plants with leaves up to 4.5 cm. broad.....31. *P. robustius* (p. 56)
- 37. Inflorescences frequently interrupted; bracts ciliate; wiry, slender plants with the larger leaves usually not exceeding 2.5 cm. in width32. *P. punctatum* (p. 57)



1. *Polygonum arifolium* L.

Common Names: Tearthumb, Halberd-leaved Tearthumb

Type Description: Linnaeus, Species Pl., p. 364, 1753

Synonym: *Tracaulon arifolium* (L.) Small

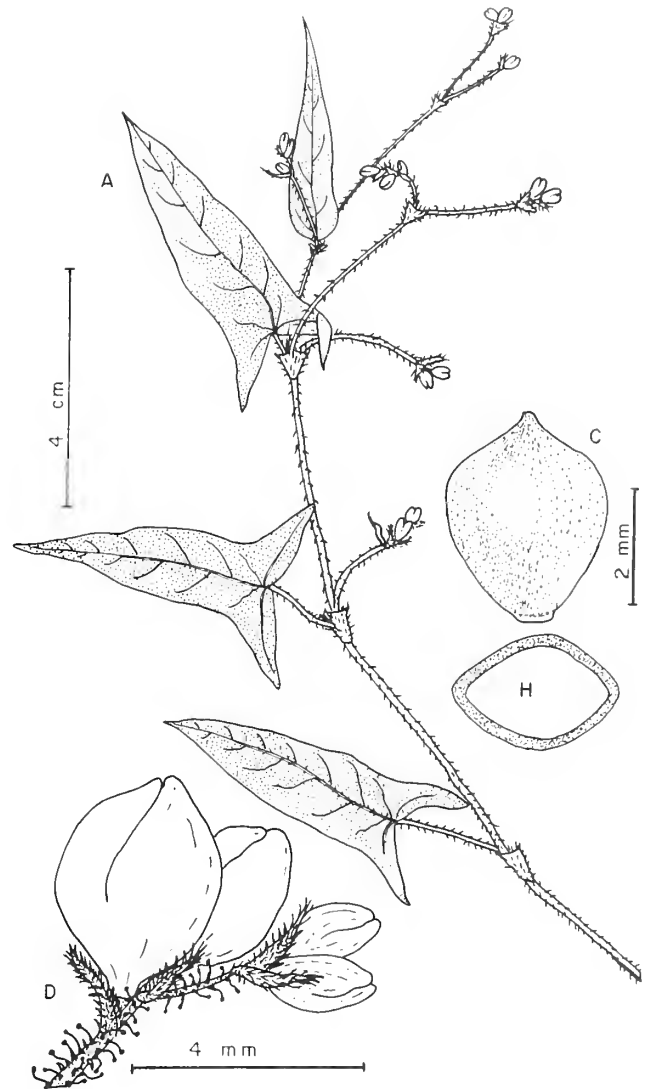
Origin: North America

Habitats: Rich, moist soil in sunny habitats, marshes and wet meadows

Habit: Scandent sprawling annual (perennial?)

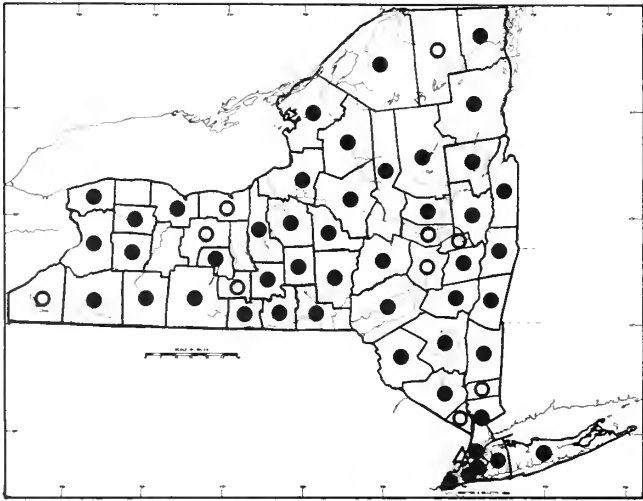
Flowering: July–October

General Distribution: Eastern North America



Description: Plants with bisexual flowers; **stigmas** 2; **styles** 2, 0.5–0.6 mm. long; **ovary** 1, becoming a lens-shaped **achene**; achene biconvex, plump, obovoid or ovoid-oblong, 3.5–5 mm. long, surface dark brown to black, smooth, lustrous, apex obtuse, base stipitate, enclosed in the perianth; **stamens** 6–8, enclosed; **perianth** about 2.5 mm. long at anthesis, up to 6 mm. long in fruit, divided from below the middle into 4 lobes, greenish to pink, white or purplish; **bracts** funnellform, oblique, sheathing, glabrous, about 2 mm. long, associated with hispid-margined **reduced leaves**; **pedicels** about 2 mm. long, articulated at the perianth base; **inflorescences** both terminal and axillary, each being a few-flowered, short raceme or subcapitate cluster; **peduncles** 1–3 cm. long, hispid, axis often with glandular hairs in the upper portion and small retrorse prickles below; **leaves** 2–18 cm. long, 1–16 cm. wide, lower ones broadly hastate-cordate with 2 widely divergent, acuminate basal lobes, **upper leaves** lanceolate with sagittate, cordate or unlobed bases, upper and lower leaf surfaces pubescent, lower with small stellate hairs, margins hispid; midrib, principal veins and petioles often with retrorse **prickles**; **petioles** 1–2 cm. long; **stipules** sheathing, funnellform, oblique, .5–1 cm. long, lower portion with short prickles, upper margin bristly-ciliate; **nodes** slightly swollen; **internodes** 4-angled, channeled, armed with stout, retrorse **barbs**; **stems** simple or usually branched, scandent, 20–120 cm. long, arising from a fibrous **root system**, usually annual, but adventitiously rooting at lower nodes.

Importance: Like *P. sagittatum*, this species is most notable as a nuisance where it forms “briar patches.”



2. *Polygonum sagittatum* L.

Common Names: Tearthumb, Arrow-vine, Scratch Grass

Type Description: Linnaeus, Species Pl., p. 363, 1753

Synonym: *Tracaulon sagittatum* (L.) Small

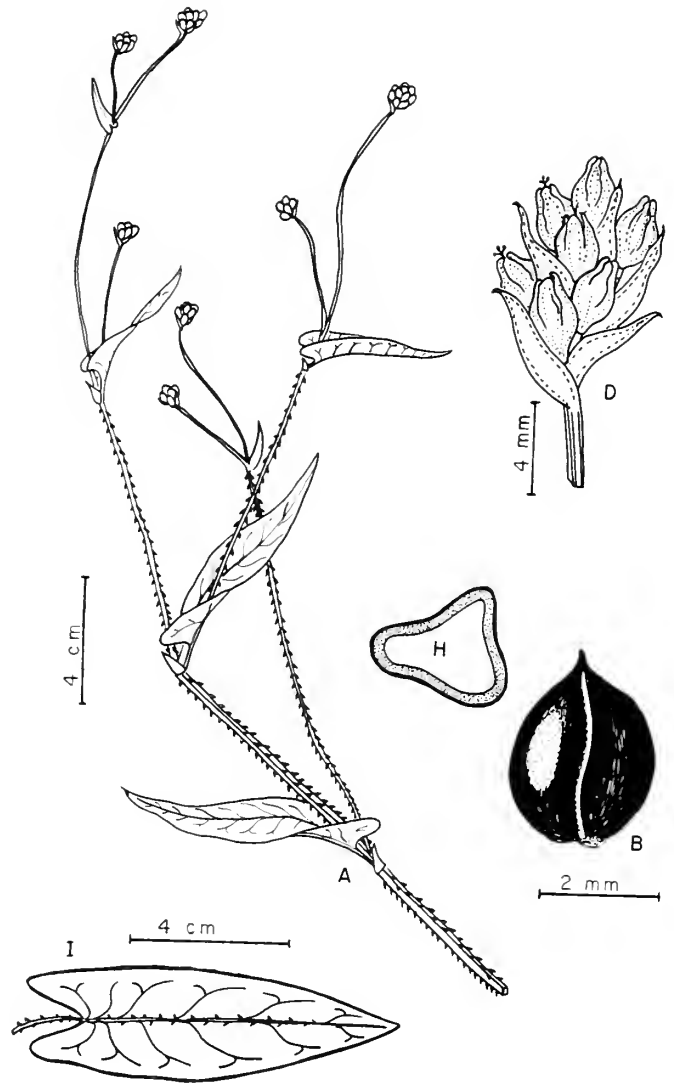
Origin: North America or Asia (Arctotertiary)

Habitats: Swampy areas, meadows, moist stream and lake banks

Habit: Scandent, spreading and drooping annual giving the appearance of a vine (perennial?)

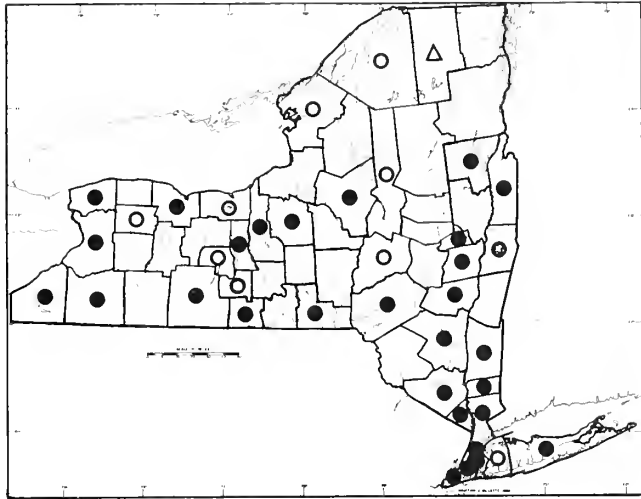
Flowering: July–October

General Distribution: Eastern North America and Asia



Description: Plants with bisexual flowers; **stigmas** 3; **styles** 3, 1–1.5 mm. long; **ovary** 1, 3-angled, becoming a trigonous achene; achene 3–3.5 mm. long, with $3 \pm$ equal sides, generally 2 slightly concave, ovoid in outline, apex acute, base stipitate, dark brown to black, smooth, lustrous, included; **stamens** 6–8, included in the perianth; **perianth** about 4 mm. long, divided from below the middle into 5 lobes, green and pink to red or white; **bracts** paired, chaff-like scales subtending and partially sheathing each flower and associated with a reduced leaf; **reduced leaves** narrow, lanceolate, 3–5 mm. long, hyaline margined, green, glabrous; **pedicels** \pm 1.5 mm. long, jointed at the base of the perianth; **inflorescences** peduncled, terminal or axillary capitate clusters; **peduncles** glabrous, elongate; **leaves** lanceolate-sagittate, apex acute, 1–12 cm. long, 0.5–3.1 cm. wide, lower surface lighter green than the upper surface, margin ciliate or with small prickles, midrib and petioles with retrorse prickles or **barbs**; **petioles** 1–5 cm. long (longer on lowest leaves); **stipules** sheathing-oblique, 0.5–1 cm. long, hyaline, smooth, summit eciliate; **nodes** slightly swollen; **internodes** 4-angled, channeled, armed with stout, sharp, retrorse **prickles**; **stems** simple or branched, scandent, 30–200 cm. long, arising from a fibrous annual **root system** (adventitiously rooting occasionally from the lower nodes).

Importance: A rather undistinguished, sprawling plant, mostly noted for the irritating cuts which it can cause.



3. *Polygonum cuspidatum* Sieb. and Zucc.

Common Names: Japanese Bamboo, Japanese Knotweed, (Mexican Bamboo)

Type Description: Siebold and Zuccarini, Fl. Jap. Fam. Nat., 2: 84, 1846

Synonym: *P. zuccarinii* Small

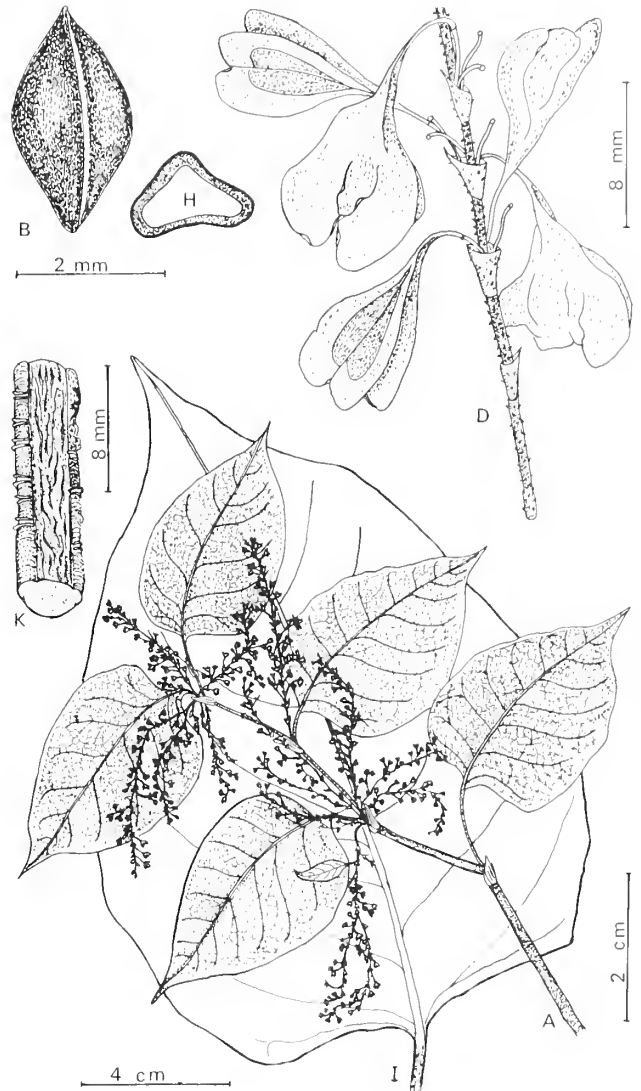
Origin: Eastern Asia

Habitats: Waste places, poorly tended gardens, etc.

Habit: Erect perennial, becoming quite tall

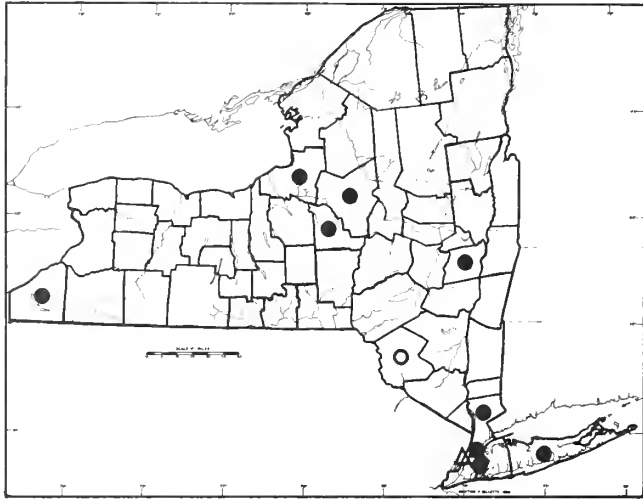
Flowering: July–September

General Distribution: Asia (cultivated and escaping in Europe and North America)



Description: Plants functionally dioecious; **stigmas** 3; **styles** 3, short; **ovary** 1, becoming a 3-angled **achene**; achene about 3 mm. long, included in the persistent perianth, with 3 oblong, concave sides, apex acute, base acute and minutely stipitate, surface black, smooth and lustrous; **stamens** 8, anther sacs yellow, included; **perianth** parted below the middle into 5 greenish-white petaloid lobes, the outer 3 strongly cucullate, about 2 mm. long at anthesis, females expanding to 8–10 mm. long, and becoming strongly winged in fruit; **perianth wings** tapering nearly to the articulated pedicel-joint, **inner perianth** lobes short, not expanded greatly in fruit; **pedicels** about 4 mm. long, jointed at about the middle; **bracts** funnelform, oblique, sheathing, dark with a few short flattened hairs on the surface; **inflorescence** a series of many-flowered, racemose panicles in the axils of the upper leaves, 6–12 cm. long, the axes with short, flat hairs; **leaves** broad, stiff, 5–15 cm. long, 2–10 cm. wide, ovate, the tips strongly attenuated or cuspidate, the bases truncate or cuneate in smaller leaves, minor venation strongly reticulate, leaf margins warty or minutely serrulate; **petioles** 1–3 cm. long with corky, lacerated ridges; **stipules** often deciduous, dark, sheathing, glabrous and somewhat oblique; **nodes** swollen; **internodes** terete or angular-channeled, glaucous, mottled, often warty; **stems** somewhat woody, zig-zag branched, 1–2.8 meters tall, erect, arising from a stout, rapidly growing **rhizome** ($2n = 44?, 88$).

Importance: These plants have some of the properties of true bamboo with regard to fast growth, horticultural usage and the problems they can cause when planted and then abandoned. As escapes from gardens and yards they can take over whole lots. They are quite hard to eradicate, since the cutting of rhizomes only propagates them. This seems to be particularly true on Long Island. Young shoots have been used as a food, cooked like asparagus or as a puree. They may also be used as a substitute for rhubarb with a specially prepared sour sauce.



4. *Polygonum sachalinense* F. Schmidt ex Maxim.

Common Names: Sachaline, Giant Knotweed

Type Description: J. Schmidt ex Maxim., Primit. Fl. Amur., p. 233, 1859

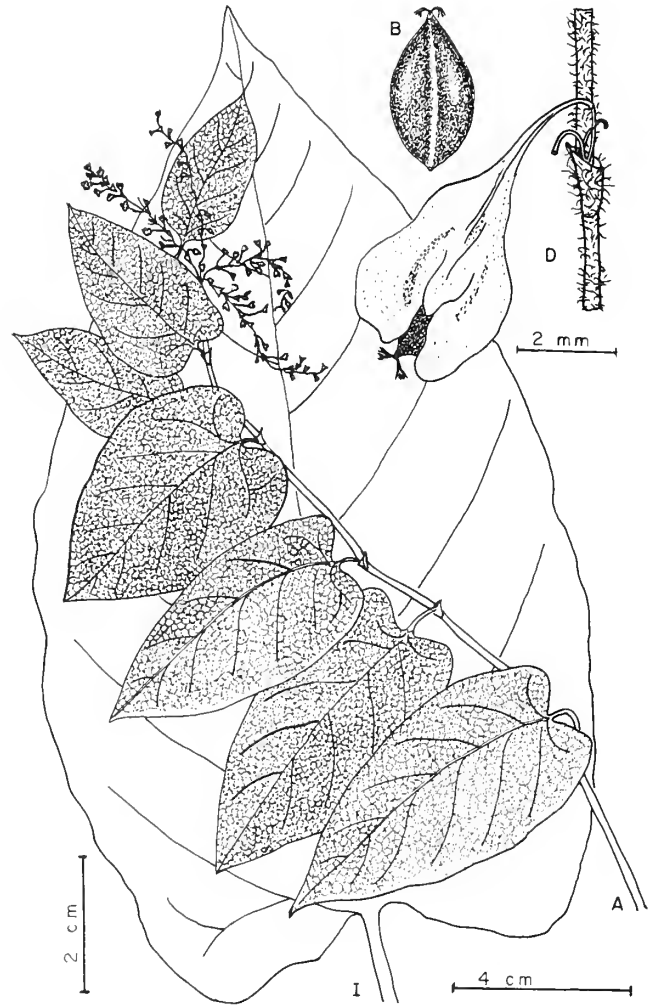
Origin: Japan and the Sachalin Islands

Habitats: Vacant lots, abandoned gardens, lawns, as an escape from cultivation

Habit: Giant, erect perennial, reaching 4 m. in height

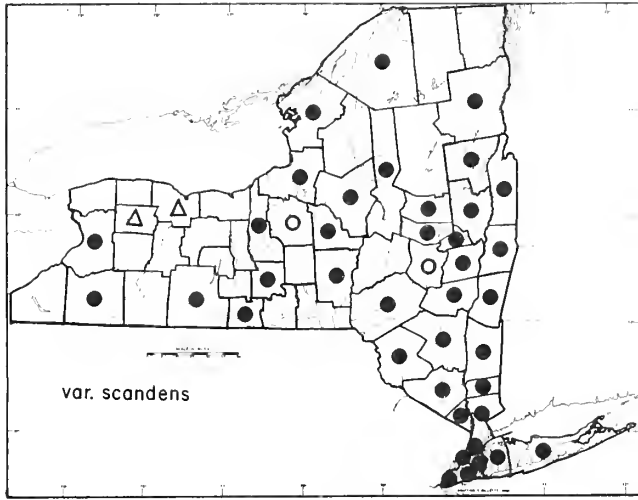
Flowering: July–October

General Distribution: Native in Asia, cultivated and escaping in Europe and North America



Description: Plants with bisexual flowers; **stigmas** 3, flared and lobed; **styles** 3, short; **ovary** 1, becoming a 3-angled **achene**; achene 2.8–3.2 mm. long, brown, lustrous, included in the perianth; **stamens** 6–8, shorter than the perianth, inner filaments dilated; **perianth** 3–4.5 (6) mm. long, greenish, 5-lobed to below the middle, with broad, pale wings which extend down the pedicel; **pedicels** 3–5 mm. long, jointed, winged above the joint contiguous with the flower; **bracts** sheathing-oblique, with acute tips, puberulent; **inflorescences** dense axillary panicles which are much-branched, often with over 100 flowers each; **peduncles** and other axes of the inflorescence densely pilose with thick, reddish hairs; **leaves** cordate-ovate with acute to acuminate tips, 10–30 cm. long, 7–20 cm. wide, glandular-punctate, lower surface puberulent along veins, glaucous; **petioles** reddish, slightly ribbed, 1–4 cm. long; **stipules** tubular-cylindric, reddish, glabrous, blending with the stem; **nodes** slightly swollen; **internodes** tough, reed-like, reddish brown, grooved; **stems** zig-zag branched, erect, up to 4 m. tall, from a woody, branched **rhizome** ($2n = \text{ca. } 44$).

Importance: This species was introduced after its discovery in the mid-19th century, lauded as a handsome ornamental. The U.S.D.A. (Lamson-Scribner, 1895) warned that it is an aggressive spreader to which “gravel walks are no obstacle.” It was once recommended as a soil binder for riverbanks, but like Kudzu (*Pueraria*) in the south, its use can be unwise where it gets out of control. The plants reach a height of 4 m., and can become a serious problem. Young shoots are eaten by livestock, and plants have been added to silage in Russia.



5. *Polygonum scandens* L.

Common Name: (Climbing) False Buckwheat

Type Description: Linnaeus, Species Pl., p. 364, 1753

Synonyms: *P. dumetorum* L., *P. cristatum* Engelm. and Gray

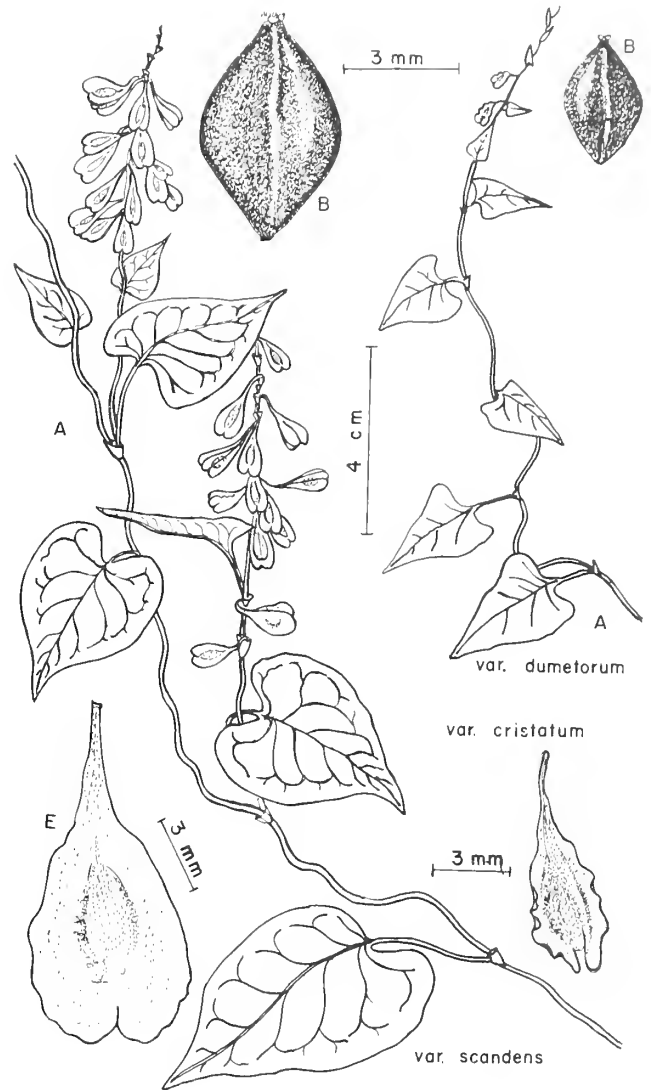
Origin: Partly native, partly introduced from Europe

Habitats: Woods, thickets, fence rows and waste places, cultivated fields

Habit: Climbing and twining or sprawling

Flowering: July–November

General Distribution: Eastern and Central United States and Canada, Eurasia

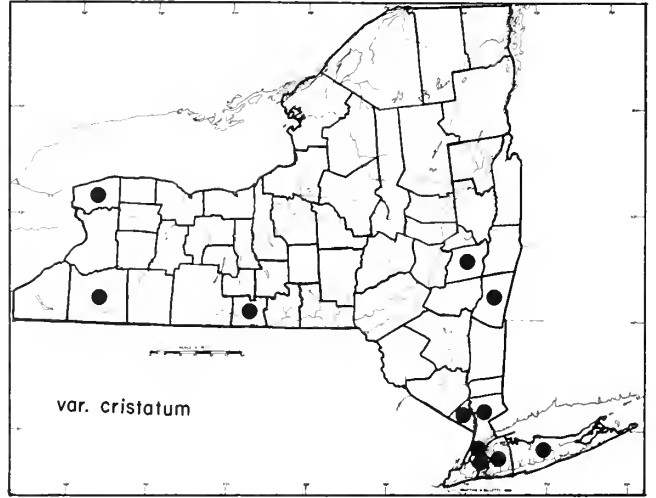
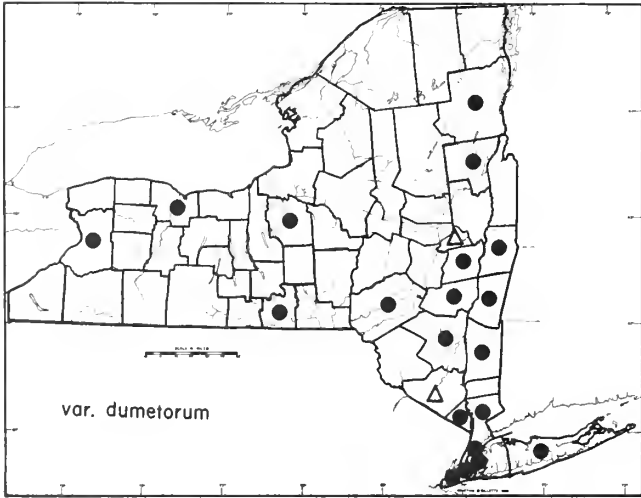


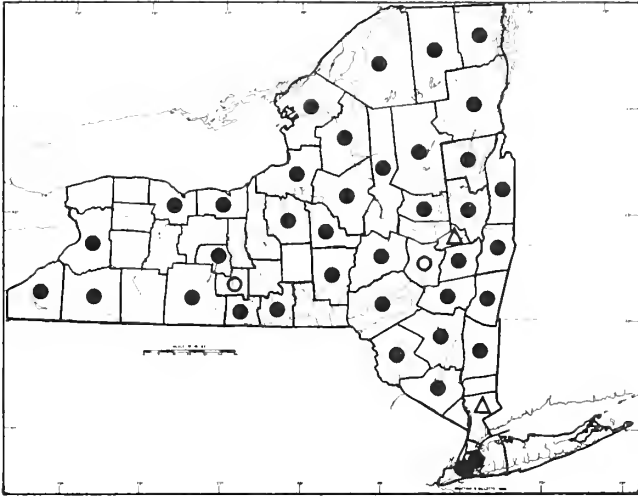
Description: Plants with bisexual flowers; **stigmas** 3, capitate, usually sessile; **styles** wanting or extremely short; **ovary** 1, becoming a 3-angled **achene**; achene sharply angled, dark brown to black, smooth, lustrous, variable in size, 2–6 mm. in length, 1–3 mm. wide, tapered at both ends; **stamens** 8, included; **perianth** 5-lobed to below the middle, with 3 winged and 2 unwinged lobes, varying greatly in size between varieties, 3.8–15.8 mm. long, 1.7–6.1 mm. wide at maturity; **wings** moderately to strongly expanded, extending nearly to the joint of the pedicel, entire or minutely lacerate, flat, undulate or crinkled in the small-flowered variety, greenish to creamy, tan or reddish; **pedicels** jointed near the flower base, 4–8 mm. long; **bracts** tubular, scarious-sheathing; **inflorescences** 1–28 cm. long, racemes or smaller fascicles borne in the axils of much-reduced leaves which are bract-like, but borne from sheathing **stipules**; **leaves** cordate to truncate-deltoid or even hastate, usually acuminate tipped, grading from dwarf inflorescence leaves, up to 14 cm. long and 7 cm. wide in the typical variety, papillose to minutely pubescent, paler below; **petioles** 0.5–10.2 cm. long, strongly reduced upward; **stipules** tubular-cylindric, 1–6 mm. long, truncate to acute, shattering with age, papillose; **nodes** scarcely swollen, eciliate; **internodes** furrowed, greenish to red-brown, elongate, slender; **stems** with twining tips, up to 3 m. long from a perennial **rootstock** ($2n = 20$, ca. 44).

Infraspecific Variation: This species has been interpreted as having 3–5 varieties, 3 of which have also been recognized as species by some authors (Small, 1892; Fernald, 1950). Achene and perianth size vary extremely from one population to another, and do not necessarily seem to be correlated on a one-to-one basis. Although the entities intergrade and overlap, there is little doubt that there are robust and depauperate phases, and that one component is introduced from Europe (var. *dumetorum*). The group is in need of careful, statistical study.

KEY TO VARIETIES

- 1. Perianth weakly winged, especially at apex, 7–9 mm. long (measured from joint), wings often undulated-crinkled, greenish to cream; achenes 2.1–2.7 mm. long at maturity.....
.....*P. scandens* L. var. *cristatum* (Engelm. and Gray) Gleason
- 1. Perianth strongly winged, especially at apex, 7–15 mm. long, wings flat or weakly undulate, brownish-green to reddish; achenes 3–6 mm. long(2)
 - 2. Perianths mostly 9–10 mm. long; lower leaves truncate to cordate, usually 3–4 cm. long, gradually reduced upward..... *P. scandens* L. var. *dumetorum* (L.) Gleason
 - 2. Perianths mostly 10–15 mm. long; lower leaves 4–12 cm. long, rounded-cordate, strongly reduced upward...
.....*P. scandens* L. var. *scandens*





6. *Polygonum cilinode* Michx.

Common Names: Fringed Bindweed, False Buckwheat

Type Description: Michaux, Fl. Bor. Amer., 1:241, 1803

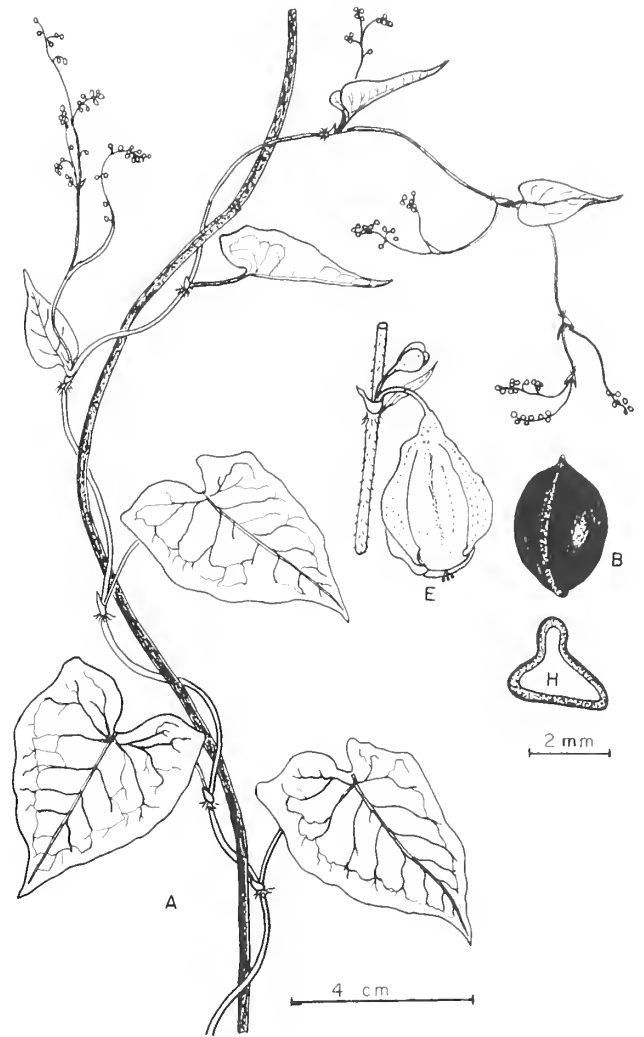
Origin: Northeastern North America

Habitats: Woodland borders, dry thickets, rocky slopes and disturbed sites

Habit: Climbing and twining (rarely erect)

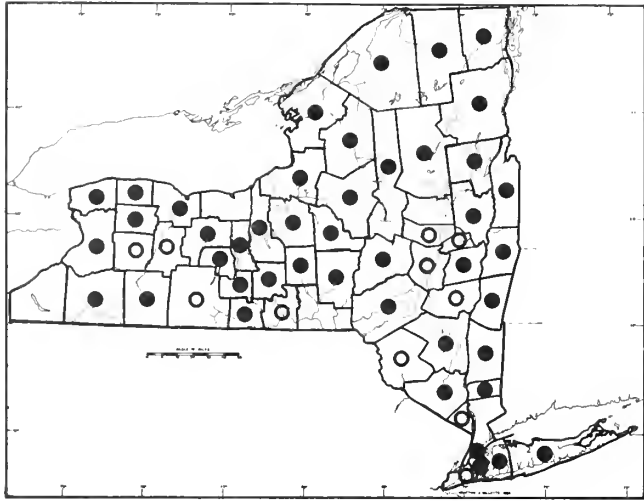
Flowering: July–October

General Distribution: Nova Scotia to North Carolina and west to Minnesota



Description: Plants with bisexual flowers; **stigmas** 3, capitate; **styles** 3, less than 0.5 mm. long; **ovary** 1, becoming a 3-angled **achene**; achene 3–4 mm. long, lustrous, smooth, brownish-black, included or slightly exerted; **stamens** 6–8, included; **perianth** 5-lobed to below the middle, obscurely keeled, 3–4 mm. long, greenish-cream to white margined; **pedicels** wiry, somewhat reflexed, 3–4 mm. long; **bracts** sheathing, 1–2 mm. long, green to red-tinged; **inflorescences** slender, elongate, interrupted panicles of small fascicles and both terminal and axillary racemes, up to 15 cm. long; **peduncles** reddish-puberulent; **leaves** cordate-ovate, with irregularities and some sharp angles, pilose-hispid, strongly veined and becoming reddish beneath, 2–6 (12) cm. long, 2–5 (10) cm. wide, drastically reduced upward; **petioles** up to 6 cm. long, pilose-hispid; **stipules** sheathing, oblique, scarious, reddish, glabrous or puberulent; **nodes** with a fringe of reflexed hairs and slender bristles at the base of the stipule; **internodes** slender, terete, reddish, pilose-hispid; **stems** twining or sprawling (rarely erect) up to 5 m. long, from a perennial **rootstock** ($2n = 40$).

Intraspecific Variation: Plants of rocky or sandy areas may stand erect or ascend from a prostrate stem in forma *erectum* (Peck) Fern. Nearly glabrous populations are known from Virginia and West Virginia.



7. *Polygonum convolvulus* L.

Common Names: Black Bindweed, Cornbind, Ivy Bindweed, Nimble Will

Type Description: Linnaeus, Species Pl., p. 364, 1753

Synonym: *Bilderdykia convolvulus* (L.) Dum.

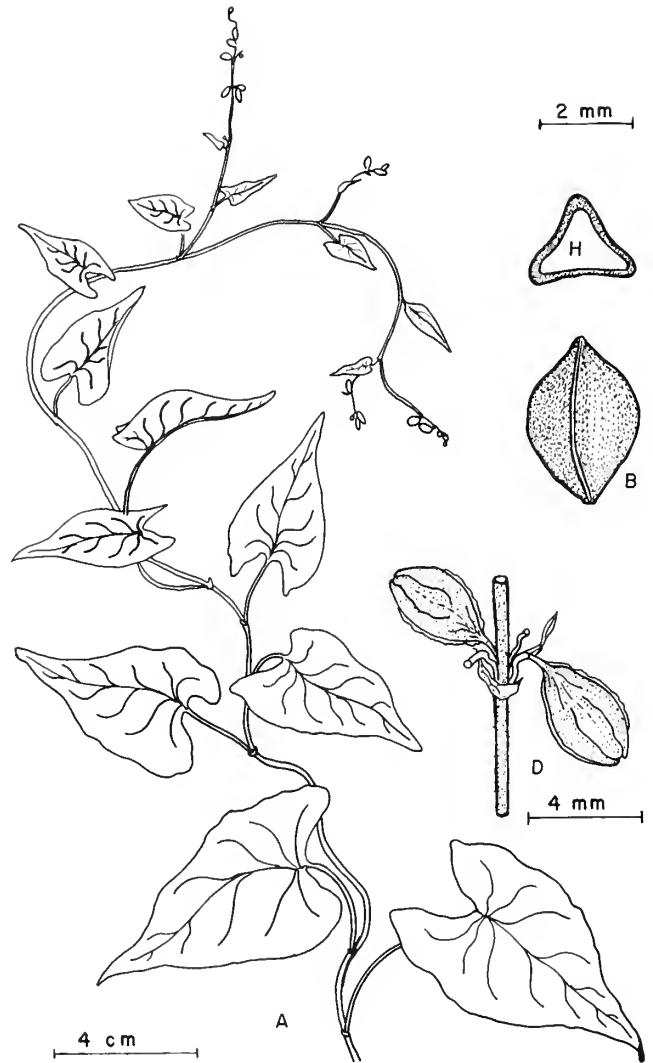
Origin: Europe

Habitats: Cultivated fields, waste places, roadsides, railroad tracks, etc.

Habit: Trailing or climbing annual vine (depauperate specimens may be erect)

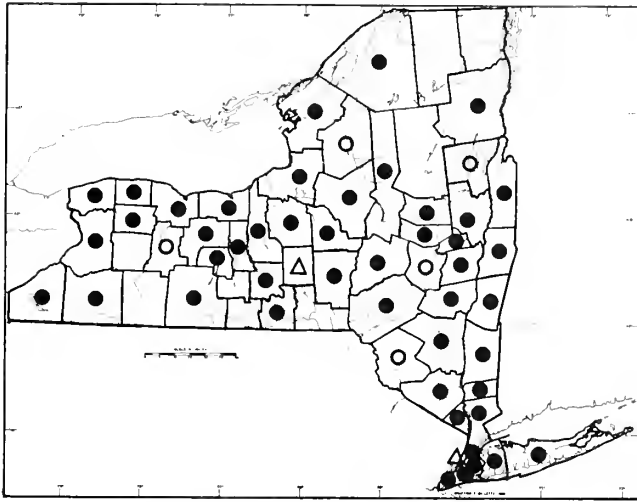
Flowering: May–October

General Distribution: Middle latitudes of the Northern Hemisphere



Description: Plants with bisexual flowers; **stigmas** 3, capitate, approximate; **styles** 3, very short, united just below stigmas; **ovary** 1, becoming a 3-angled **achene**; achene 3–4 mm. long, tightly enclosed, by the accrescent perianth, ovoid-acute at the tip and base, black, minutely granular-tuberculate, dull to somewhat shiny; **stamens** 8, included; **perianth** divided from below middle into 5 lobes, greenish-white or purple-blotched, 3.5–5 mm. long at maturity, outer lobes obscurely keeled and often beset by short, blunt, hyaline hairs; **pedicels** shorter than perianth, jointed above the middle; **bracts** pellucid, scale-like, largely concealed by stipules; **inflorescences** of 3–6 flowered fascicles, widely spaced below, axillary or appearing as terminal racemes due to leaf reduction and shortened internodes near the apex; **leaves** ovate-cordate to triangular-sagittate, up to 6 cm. long, 5 cm. wide, glabrous or with blunt, flat hairs on margins and veins; **petioles** slender, up to 5 cm. long, with rows of short hairs; a **nectariferous gland** at the base of the petiole; **stipules** sheathing, oblique, 2–4 mm. long, truncate, reddish-brown, margin entire, only lacerate with age, surface with small transparent hairs; **nodes** scarcely swollen, eciliate; **internodes** slender, wiry, reddish, grooved with small, reflexed, hyaline hairs; **stems** branched, twining (rarely erect) usually climbing on other plants, up to 5 m. long, arising from a wiry **taproot** ($2n = 20, 40$).

Importance: This is a particularly noxious and aggressive weed of crop fields; a yellow (musk colored) dye has been extracted from the whole plant; primitive man in Europe ground the seeds finely for flour. It is not a desirable food source due to low starch and highly abrasive achene fragments.



8. *Polygonum virginianum* L.

Common Name: Jumpseed

Type Description: Linnaeus, Species Pl., p. 360, 1753

Synonym: *Tovara virginiana* (L.) Raf.

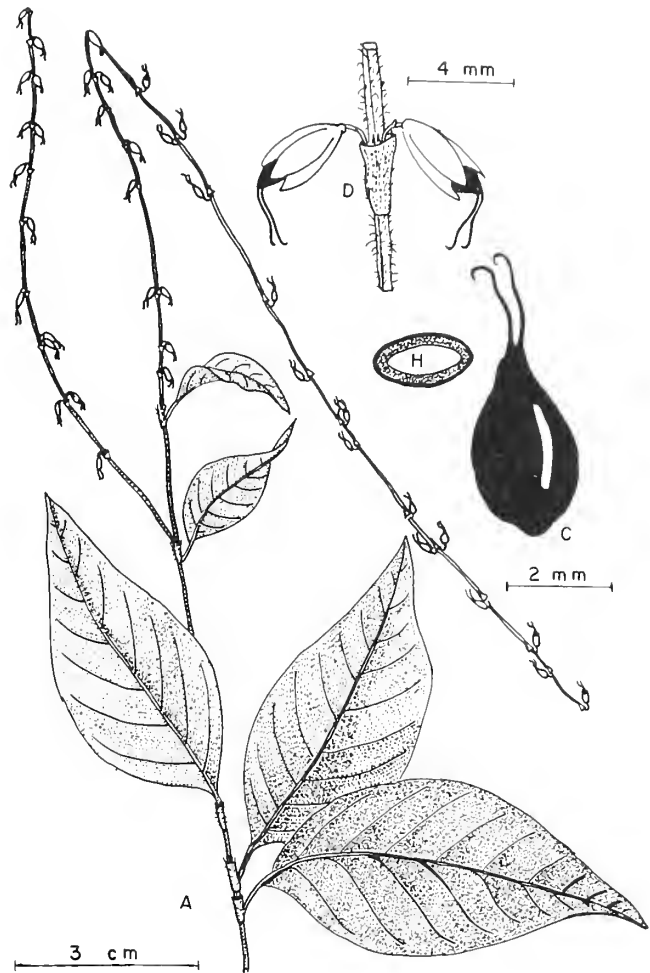
Origin: Eastern North America (Arctotertiary element with relatives in Asia)

Habitats: Rich woodlands, moist soils of streambeds and lake margins

Habit: Spreading to erect perennial

Flowering: July–October

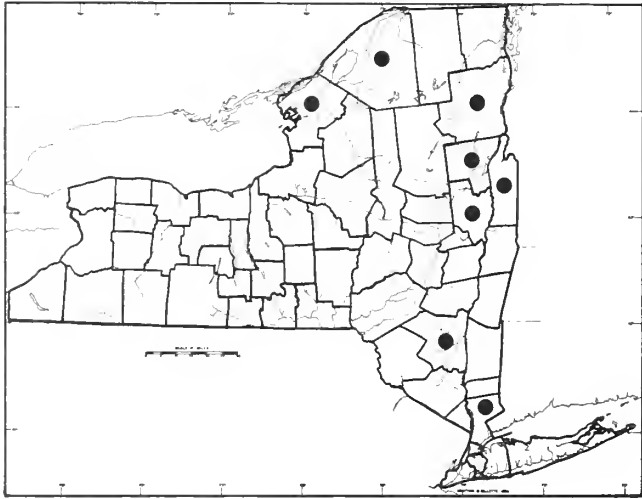
General Distribution: Eastern United States and Canada, south to Florida and Texas (Asia)



Description: Plants with bisexual flowers; stigmas 2, minute; styles 2, separate to the bases, rigid, resilient, deflexed and hooked at the tips, 2–4 mm. long; ovary 1, becoming a brown, lens-shaped achene; achene 3.4–4 mm. long, ovoid-oblong, enclosed or weakly exerted; stamens 5, about the length of the perianth; perianth 4-lobed to about the middle, greenish-white (rarely pink), 3.6–4 mm. long; pedicels jointed at the perianth base, about 3 mm. long, often deflexed; bracts sheathing-ciliate, overlapping near the inflorescence tip, but remote lower down; inflorescences 1-several, much-interrupted, narrow, elongate panicles of fascicles, 2–3 flowers per bract, the terminal inflorescence up to 50 cm. long; peduncles pubescent; leaves ovate to elliptic-lanceolate, 3–16 cm. long, 1.5–7 cm. wide, scabrous to strigose-pilose, especially beneath (rarely almost glabrous); petioles 1–20 mm. long; stipules tubular-cylindric, strigose, with bristles on the margins; nodes scarcely swollen; internodes often elongate, pubescent; stems lax to erect, up to 1.5 meters tall, from a knotty to slender rhizome ($2n = 44$).

Infraspecific Variation: Plants with reddish flowers have been called forma *rubra* Moldenke; plants with thin, almost glabrous leaves and slender rhizomes (possibly shade adaptations) have been called var. *glaberrima* Fern.

Note: The name Jumpseed comes from the properties of the indurate styles which have a spring-like resilience, and may project the achene up to 3 meters if properly snagged.



9. *Polygonum douglasii* Greene

Common Name: Knotweed

Type Description: Greene, Bull. Calif. Acad. II, 1:125, 1885

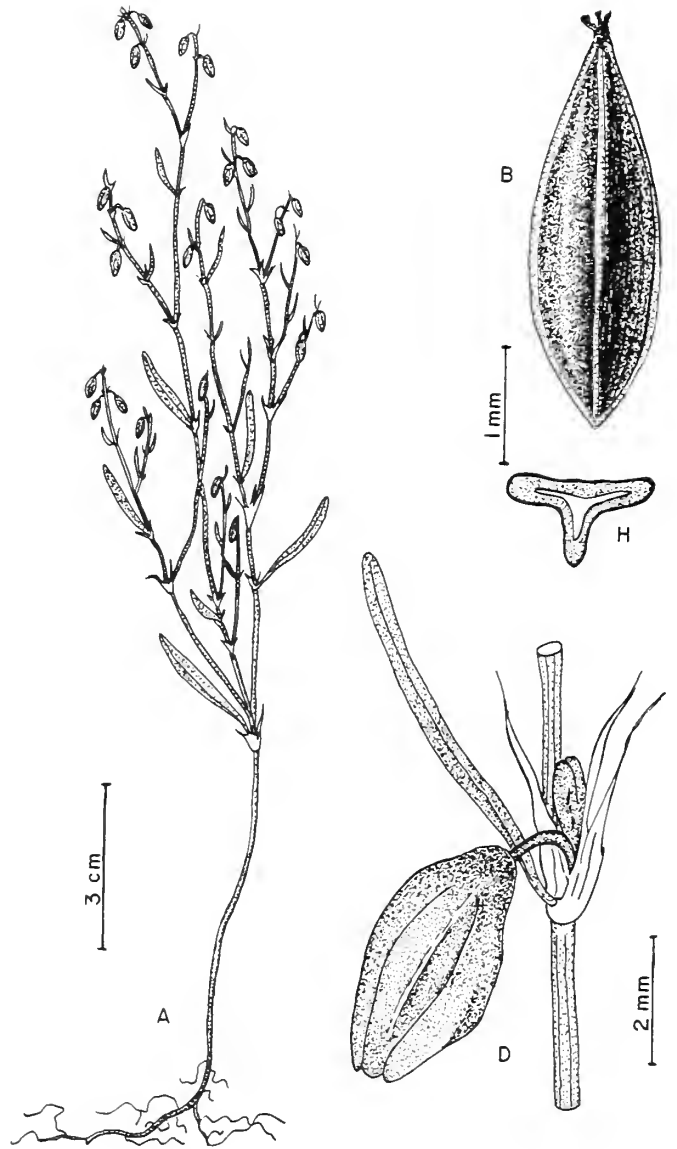
Origin: Native, Western North America

Habitats: Dry soil or gravel, primarily in the mountains

Habit: Erect, simple to branched annual

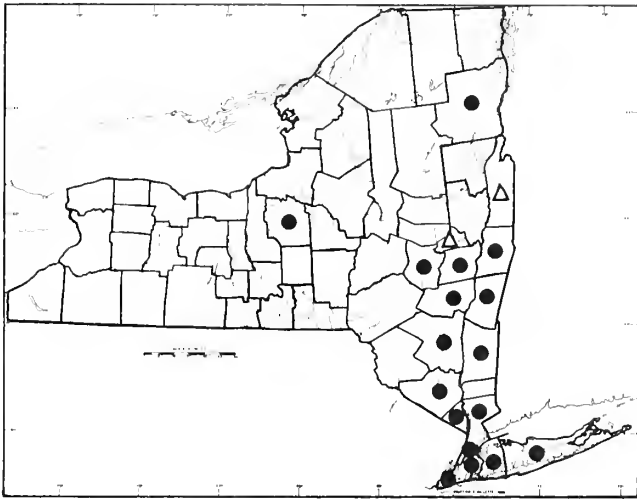
Flowering: June–September

General Distribution: Mostly Western North America, extending to the Northeast, but less common



Description: Plants with bisexual flowers; **stigmas** 3; **styles** 3, about 0.4 mm. long; **ovary** 1, becoming a trigonous **achene**; achene strongly 3-angled, lanceolate in outline, 3–3.5 mm. long; included in and exceeded by the perianth, (achene) with three concave sides, apex acuminate, also tapered below to a slightly stipitate base, surface black, smooth and lustrous; **stamens** usually 8, the inner dilated at the base the outer adnate to the perianth and not exceeding it; **perianth** 4–6 mm. long, divided from near the base into 5 petaloid lobes, tannish to green with white or roseate margins and cucullate tips; **bracts** pellucid, sheathing, interior to the stipules and scarcely discernible; **inflorescences** 2–4 flowered fascicles scattered on the erect branches, flowers more common toward the branch tips, reflexed on 1–4 mm. long **pedicels**; **leaves** linear or narrowly oblong to lanceolate, reduced in size toward the apex of the plant, 15–40 mm. long, 2–8 mm. wide, margins sometimes revolute; **petiole** short or absent with the leaf jointed directly to the stem; **stipules** 5–12 mm. long, hyaline, sheathing, lacerate; **nodes** slightly swollen; **stems** striate, often 4-angled above the base, simple to freely branching, erect, 10–75 cm. tall, arising from a slender, wiry; **taproot** ($2n = 40$).

Intraspecific Variation: Most of the variation in this widespread species occurs in the Western States where it is more common and has alpine varieties.



10. *Polygonum tenue* Michx.

Common Name: Knotweed

Type Description: Michaux, Fl. Bor. Amer., I:238, 1803

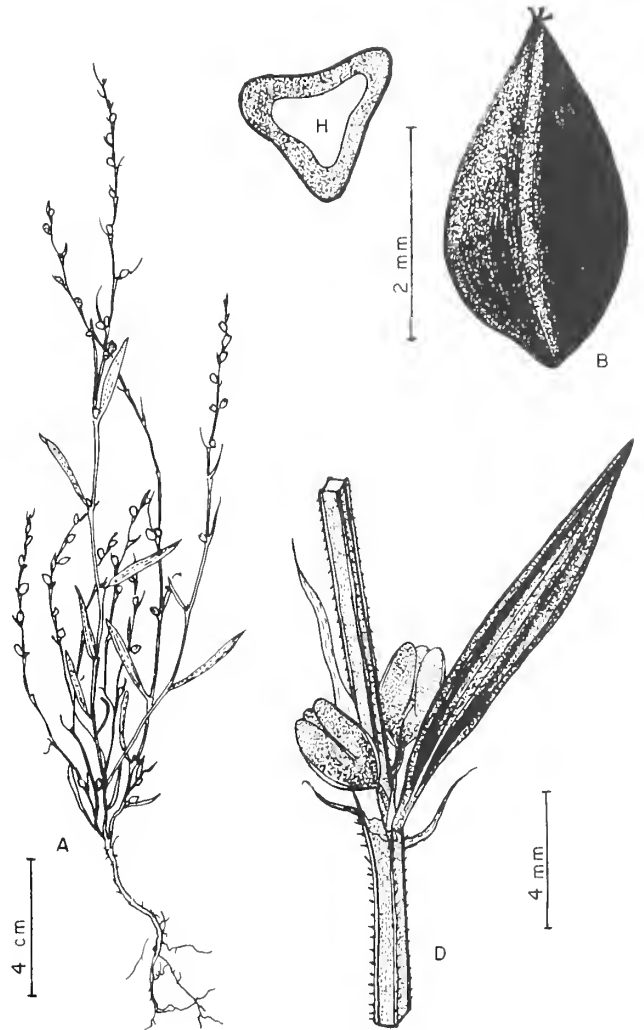
Origin: North America

Habitats: Dry, open, sunny situations, shale hillsides

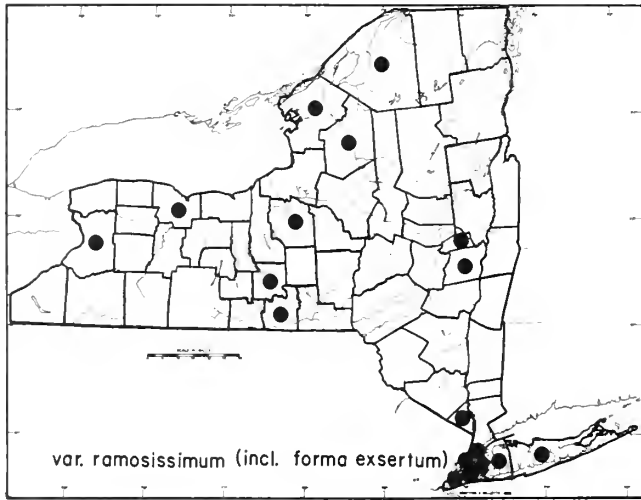
Habit: Erect, slender, wiry annual

Flowering: June–October

General Distribution: Eastern Canada to Minnesota, south to Georgia and west to New Mexico



Description: Plants with bisexual flowers; **stigmas** 3; **styles** 3, 0.3–0.4 mm. long; **ovary** 1, becoming a sharply trigonous **achene**; achene ovoid, tightly enclosed by the perianth, (achene) 2.5–4 mm. long with 3 concave sides, apex acute, lower half tapering to a somewhat stipitate base, surface black or dark brown, smooth or faintly striate at the angles or apex; **stamens** usually 8: filaments of inner stamens dilated at the base, outer ones adnate to the perianth lobes; **perianth** 2.6–4.2 mm. long, divided from near the base into 5 petaloid lobes, brownish to green with white or roseate margins, inner lobes shorter than the outer ones, which are cucullate; **inflorescence** an elongate, slender, interrupted spiciform raceme; **flowers** disposed singly or in 2–3 sparsely flowered fascicles; flowers erect on **pedicels**, 1–1.5 mm. long; **bracts** hyaline, sheathing within the stipules which are similar; **leaves** narrowly lanceolate to linear, firm, ascending, 5–40 mm. long 1–8 mm. wide, with 2 deep pleats parallel to the midrib axis, apex acute or cuspidate, base acute, margins slightly toothed and sometimes revolute; **stipules** hyaline, sheathing, lacerate, 3–15 mm. long; **nodes** slightly swollen, scabrous; **stems** 4-angled above the base, ridged, wiry, simple or branched, strongly ascending, arising from a slender annual **root** ($2n = 20, 30, 32$).



11. *Polygonum ramosissimum* Michx.

Common Name: Knotweed

Type Description: Michaux, Fl. Bor. Amer., I:236, 1803

Synonyms: *P. prolificum* (Small) Rob., *P. exsertum* Small, *P. atlanticum* (Rob.) Bickn.

Origin: Native of North America

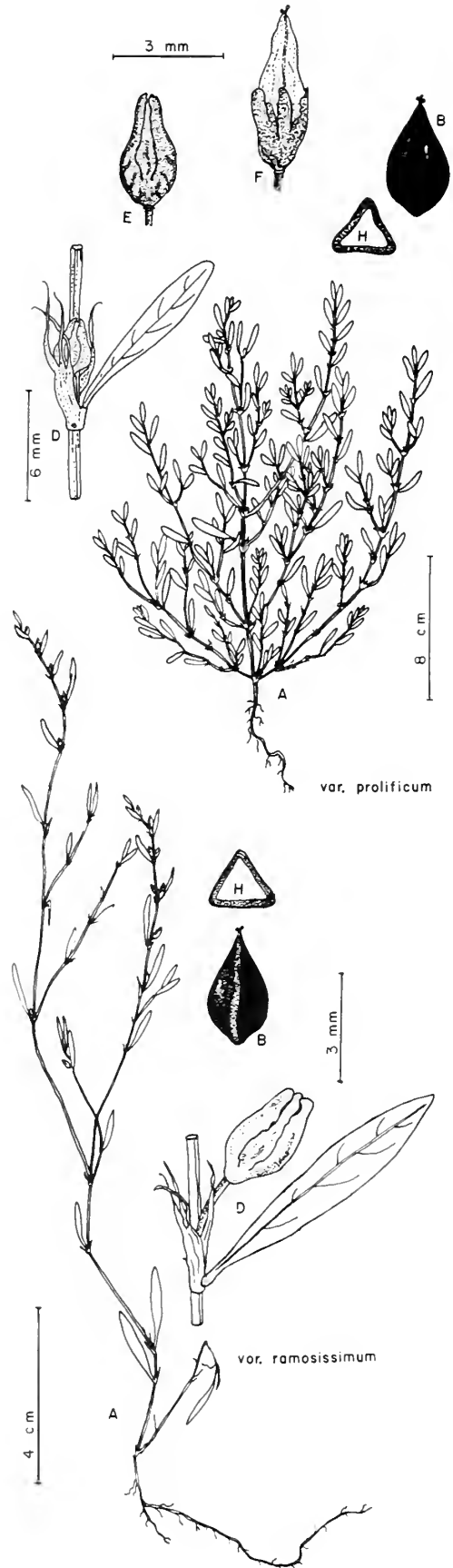
Habitats: Salt marshes, sandy soils, lake shores, riverbeds and waste places on occasion

Habit: Erect or ascending, much branched, occasionally procumbent-prostrate

Flowering: July–November

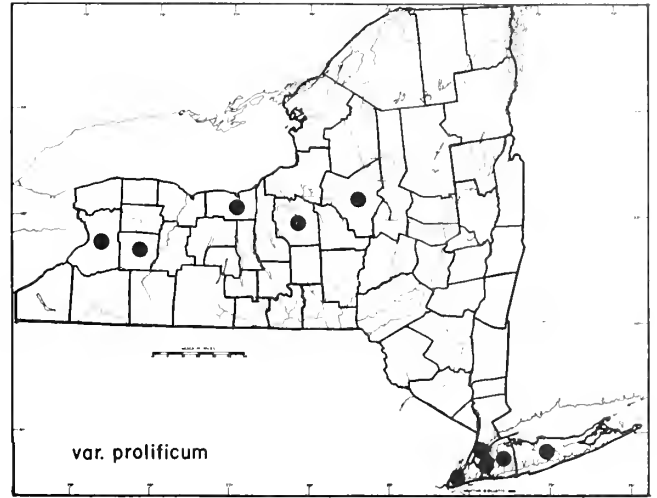
General Distribution: The typical variety is mostly Midwestern from Saskatchewan to New Mexico; salt marsh populations of the other variety and form range from Maine to Virginia

Description: Plants with bisexual flowers; stigmas 3; styles 3, united below, 1–5 mm. long; ovary 1, becoming a trigonous (or biconvex) achene; achenes often dimorphic (especially in late season): either ovoid, 3-angled, with 3 concave sides, 2–3.5 mm. long, brown with shiny surfaces, included in the perianth, or lens-shaped, inflated, lanceolate with 2 convex sides, 4–6.5 mm. long, pale yellow-brown to greenish, shiny, exserted from the perianth; stamens 3–6: inner filaments dilated, anthers yellowish, not exceeding the perianth; perianth 3–4 mm. long, divided from near the base into 5 (6) petaloid lobes, brownish green to yellow-green or with roseate margins, outer lobes, cucullate, inner ones short, flattened; base of fruiting perianth usually with slightly keeled or pouch-like protrusions; bracts sheathing, pellucid; inflorescences 2–4 flowered fascicles, weakly or strongly exserted from the stipules in the axils; pedicels angular or terete, 1–3.5 mm. long; leaves from bluish to yellow-green, sometimes glaucescent, prone to red fall coloration,



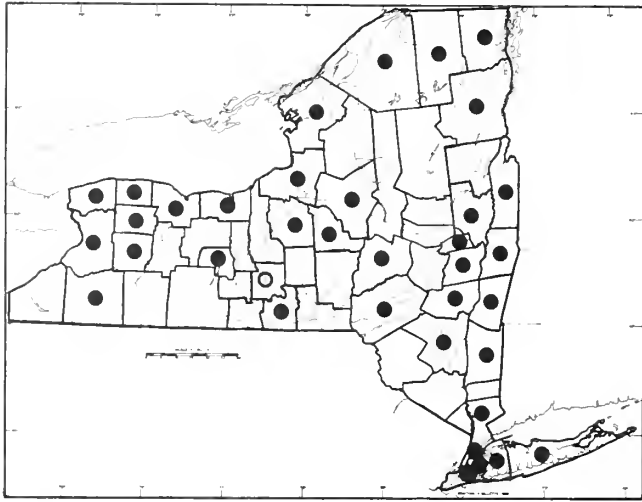
either heterophyllous with lanceolate leaves or approaching homophylly with oblanceolate leaves; leaves 0.7–6 cm. long, 1–8 mm. wide, tips acute to broadly rounded; **petiole** short, jointed to stipular sheath; **stipules** several parted to 2-cleft, sheathing, hyaline, or brownish, becoming lacerate; **nodes** slightly swollen; **stems** prominently ribbed, woody, erect-ascending (rarely prostrate) profusely branched with age, up to 2 m. tall, arising from a stout **taproot** ($2n = 20, 60$).

Intraspecific Variation: As recognized here, this is a species complex of considerable variability. The entities treated may be recognized as species upon further study, but specimens seen so far show too much integradation to be separated with satisfaction. The two reported ploidy levels suggest a search for a tetraploid level as well, and distribution patterns are also somewhat distinct. "*P. exsertum* Small" appears to be a salt marsh form in which there is a high percentage of exserted achenes. Judgments will be reserved until further reliable characters are found.



KEY TO VARIETIES

- 1. Plants strongly heterophyllous, leaf tips of the larger leaves obtuse to acuminate; pedicels 2.5–3.5 mm. long *P. ramosissimum* L. var. *ramosissimum*
- 1. Plants approaching homophylly, leaf tips rounded or slightly obtuse; pedicels less than 2 mm. long..... *P. ramosissimum* L. var. *prolificum* Small



12. *Polygonum aviculare* L.

Common Names: Knotweed, Knotgrass

Type Description: Linnaeus, Species Pl., p. 362, 1753

Synonyms: *P. heterophyllum* Lindm., *P. monspeliense* Tieb.

Origin: Eurasia

Habitats: Disturbed and cultivated soils, roadsides

Habit: Much branched, erect to sprawling-decumbent

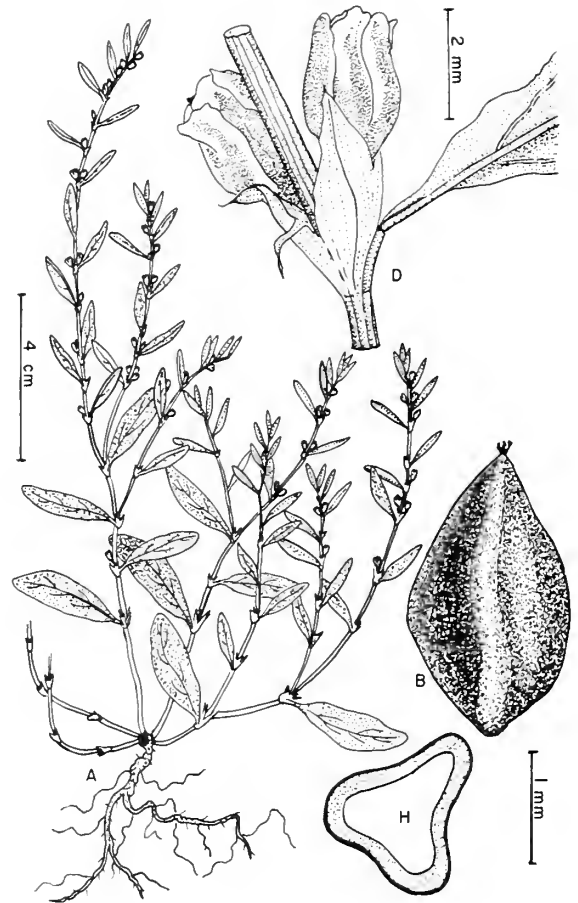
Flowering: June–November

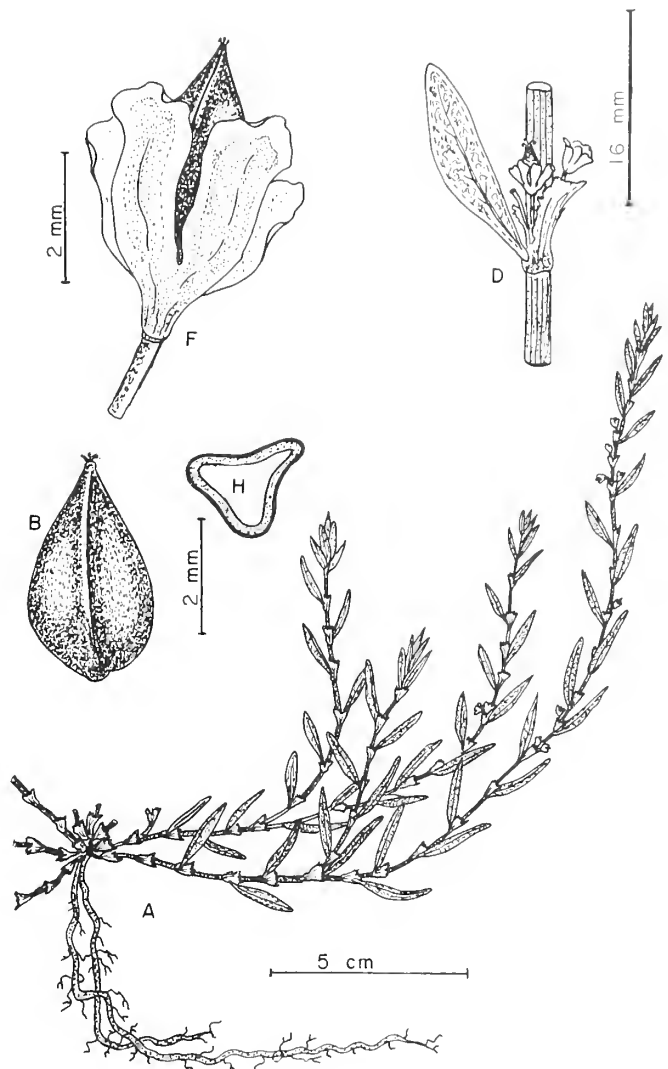
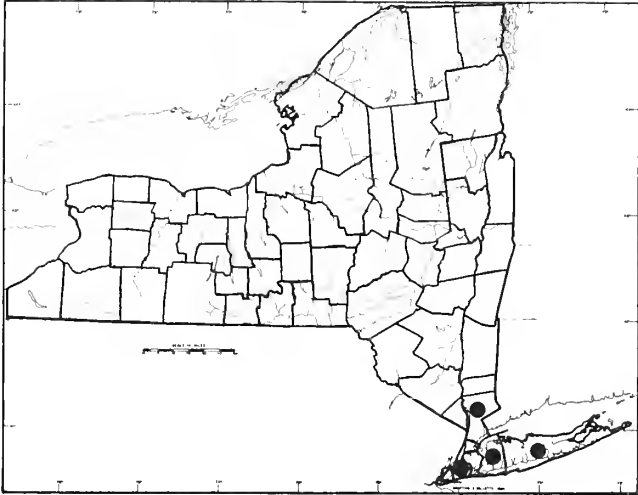
General Distribution: Cosmopolitan weed

Description: Plants with bisexual flowers; **stigmas** 3; **styles** 3, short; **ovary** 1, becoming a trigonous **achene**; achene 2.5–3.2 mm. long, commonly included in the persistent **perianth**, (achene) with 2–3 ovoid-concave sides, apex acute, base somewhat stipitate, surface brown, punctate and striate, lusterless; **stamens** 8 (5–6): filaments dilated at the base, anther sacs yellow, not exceeding the perianth; **perianth** about 2.5–3.1 mm. long, divided to below the middle into 5 petaloid lobes . . . 3 outer, 2 inner; outer lobes incurved, the inner flat; **lobes** obtuse with a greenish midrib and white, cream or roseate margins; **flowers** connate-turbinate below; **bracts** pellucid, often enveloping the flower bases; **inflorescences** usually 3–6 flowered fascicles, barely exerted from sheathing stipules in the leaf axils; plants **heterophyllous**; **leaves** gray-green, lanceolate to ovate-lanceolate; early stem leaves 25–60 mm. long, 4–15 mm. wide; later leaves much reduced, about 1/3 that size; leaves on short, jointed **petioles**, deciduous in late season (especially the larger ones); **stipules** 4–8 mm. long, hyaline, becoming lacerated; **nodes** slightly swollen; **stems** terete or somewhat grooved, freely branching, sprawling to erect, up to 2 m. long; arising from a wiry **taproot** ($2n = 60, 40?$).

Intraspecific Variability: This species has had a variety of interpretations, and a large number of entities have been named as infraspecific categories under this binomial. It has long been confused with homophyllous *P. arenastrum* Bor., which once held varietal status under it. As recognized here (*sensu* Styles, 1962), it is the decidedly heterophyllous weed which shows variation mostly in habit, crinkling of the leaf margin and relative crowding of the inflorescences near the branch tips; flowers vary in size and color, and achenes vary in size and number of concave sides (all of this sometimes on the same plant). None of the above variations appear to warrant assignment of trinomials at present.

Importance: It is a weed of cultivated fields and waste places; achenes and young shoots are eaten by birds (hence its specific name) and stock graze on it; parched achenes have been used as food; in the lore of Shakespeare's time it was said to stimulate the appetites of swine and retard the growth of children if eaten raw; an infusion of uncooked materials is said to have diuretic properties, and has been used to treat internal bleeding, kidney disease and to expel stones; externally it has stiptic properties and has been used to treat sores and hemorrhages such as nosebleed; African natives take it as an agent against malaria.





13. *Polygonum glaucum* Nutt.

Common Names: Seaside or Seabeach Knotweed

Type Description: Nuttall, Gen., I:254, 1818

Origin: Native to North America

Habitats: Maritime sands, beaches, saline pond and marsh margins

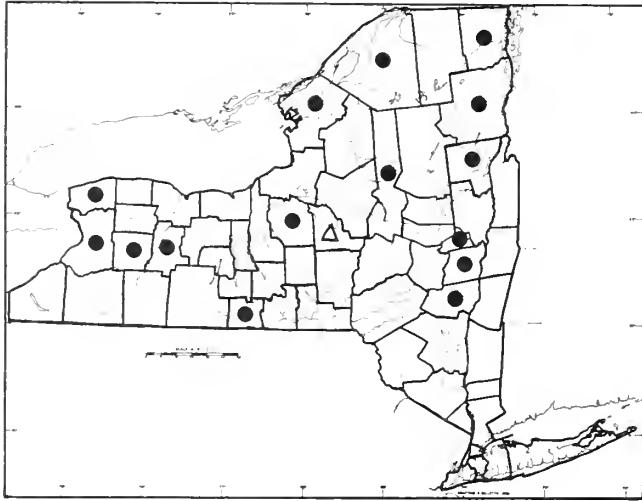
Habit: Prostrate to ascending, wiry annual

Flowering: July–Number

General Distribution: East coastal zone of United States, Massachusetts to Georgia; inland in saline situations

Description: Plants with bisexual flowers; **stigmas** 3; **styles** 3, 0.4 mm. long; **ovary** 1, becoming a 3-angled **achene**; achene ovoid 3–4 mm. long, 2–2.5 mm. wide, exerted from the perianth, apex acute or acuminate, base somewhat stipitate, surface brown to blackish, lustrous; **stamens** 8: filaments dilated at the base, anther sacs yellow, not exceeding the perianth; **perianth** 3–4 mm. long, divided from near its greenish base into 5 lobes; **lobes** obovate, obtuse, spreading, with green midribs and white to pink margins; **bracts** pellucid, enclosing the flower bases; **inflorescences** axillary, 2–3 flowered; **pedicels** slender, erect, 3–4 mm. long; **leaves** gray-green, glaucous with rugulose surfaces, narrowly elliptic with acute to obtuse tips, margins revolute, leaves 5–30 mm. long, 2–8 mm. wide, **subequal**; **petioles** short, conspicuously jointed; **stipules** 3–15 mm. long, silvery white above, brownish below, persistent, with 8–16 nerves, 2-cleft, but finally shattering with age; **nodes** slightly swollen; **internodes** generally shorter than the leaves; **stems** terete, sulcate, generally prostrate, but with upcurving branch tips 20–70 cm. long, arising from a wiry **taproot** (2n = 40).

Note: This native species was confused in early reports with European *P. maritimum* L. and was reported incorrectly under that name in New York State.



14. *Polygonum achoreum* Blake

Common Names: Knotweed, Homeless Knotweed

Type Description: Blake, *Rhodora*, 19:232, 1917

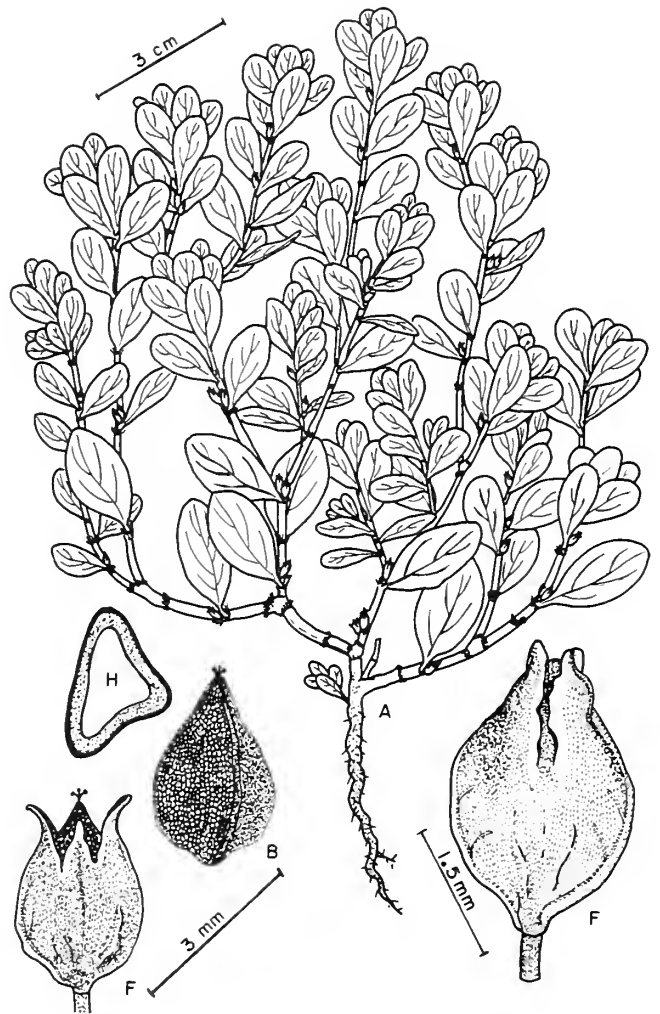
Origin: Uncertain, named from Vermont

Habitats: Dryish waste ground, disturbed soil, foot-paths (saline marshes?)

Habit: Erect when young, spreading into mats with erect tips in age

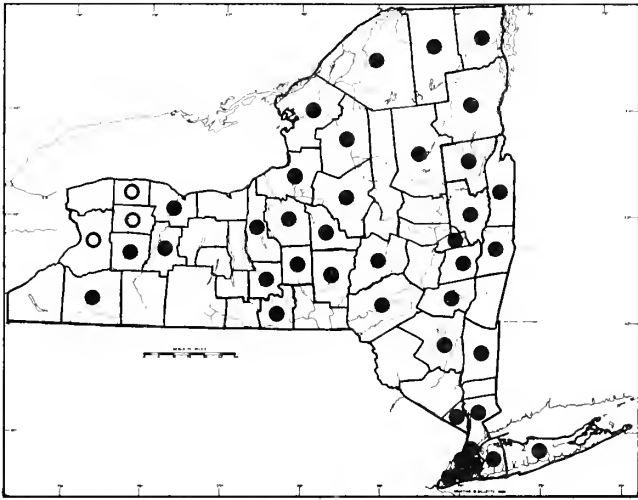
Flowering: June–September

General Distribution: Weedy in boreal North America



Description: Plants with bisexual flowers; stigmas 3; styles 3, short; ovary 1, becoming a 3-angled achene; achene 2.5–3.5 mm. long, with 2 ovoid, concave and one narrower concave sides, apex acute, base minutely stipitate, surface yellow-brown to greenish, punctate-granular; stamens 3–8: filaments dilated at the base, anther sacs yellow, not exceeding the perianth; perianth 2.5–3.7 mm. long, constricted above the achene into a neck-like tip (this is sometimes spread by oversized achenes which become exerted in the late season); perianth lobes 5, the outer ones narrow, curved and strongly cucullate, often slightly keeled, the sinuses between lobes not extending to the middle of the perianth which is connate and broadly urn-shaped below; flowers are cream to green (or pink-tinged); inflorescences axillary, usually 1–3 flowered; pedicels 1–4 mm. long, erect, often concealed by the stipules; leaves bluish-green, numerous and crowded near the apex, subequal in size, oval to elliptic with rounded tips, 9–30 mm. long, 3–15 mm. in width; petiole short, jointed; stipules 5–11 mm. long, sheathing hyaline, 2-cleft, eventually shattering, nodes slightly swollen; stems terete, sulcate, erect when young, becoming prostrate with many upturned lateral branches (stems rarely up to 70 cm. long), arising from a woody taproot ($2n = 20$).

Intraspecific Variation: The species varies in habit, often being misidentified as *P. buxiforme* Small when sprawling and as *P. erectum* L. when upright. Color of perianth margins varies from cream to pinkish, and late-season achenes are elongate and become exerted, thereby changing the flower shape.



15. *Polygonum arenastrum* Boreau

Common Names: Doorweed, Knotgrass

Type Description: Boreau, Fl. Centr. Fr., Ed. 3, 2:560, 1857

Synonyms: *P. aequale* Lindm., *P. aviculare* L. var. *arenastrum* (Bor.) Rouy

Origin: Eurasia

Habitats: Disturbed or packed soil and gravel, sidewalks, paths, roadways, etc.

Habit: Cespitose, mat-forming annual weed

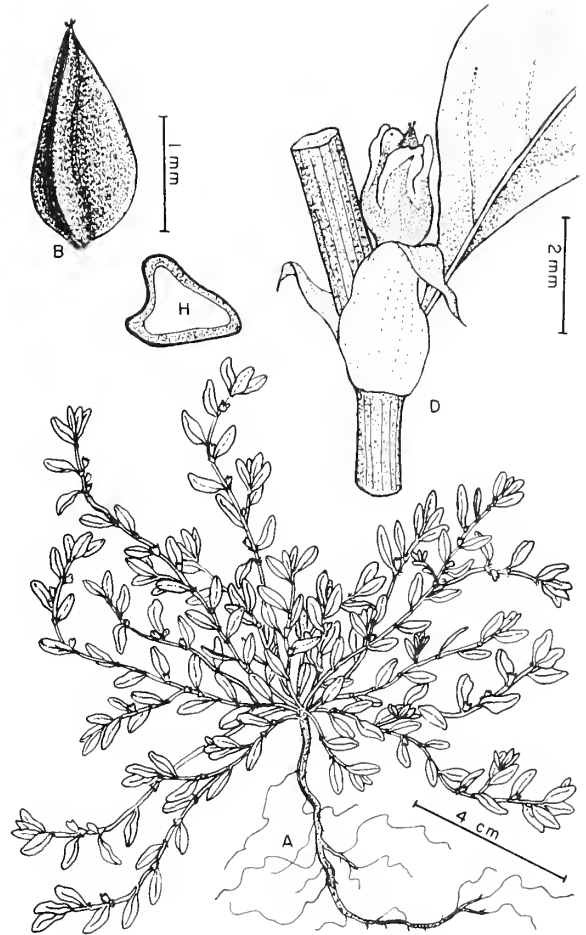
Flowering: June–December

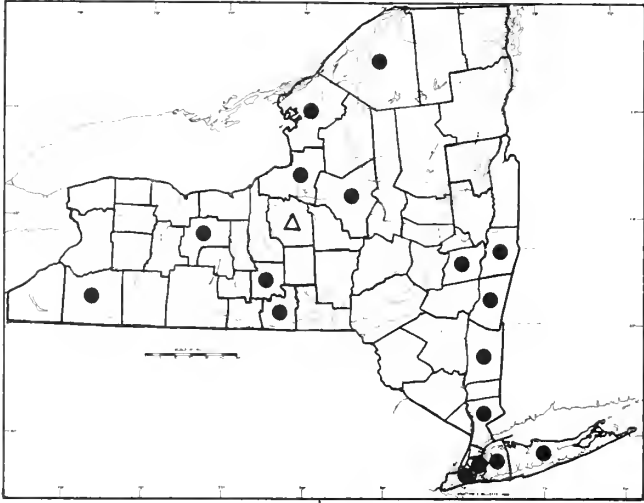
General Distribution: Cosmopolitan

Description: Plants with bisexual flowers; **stigmas** 3, **styles** 3, short; **ovary** 1, becoming a compressed, trigonous **achene**; achene 1.5–2.3 mm. long, included to exserted from the perianth, (achene) with two convex or flattish sides and one narrow, concave side (rarely biconvex), apex acute, base minutely stipitate, surface dark brown, lightly striate-punctate, occasionally somewhat lustrous at the edges; **stamens** generally 5 (8): filaments dilated at the base, anther sacs yellow, not exceeding the perianth; **perianth lobes** incurved or flared in fruit, obtuse to rounded, petaloid, greenish with white margins (often rose-tinted), equaling the achene length or slightly shorter; **perianth** divided to about the middle, connate below; **bracts** pellucid, sheathing; **stipular** sheaths hyaline, shattering; **inflorescences** axillary, usually 2–3 flowered, barely exserted from the sheath; **leaves** **subequal**, bluish-green, broadly elliptic to oval-oblong, rounded or bluntly obtuse at the tips, 5–20 mm. long, 3–9 mm. wide often deciduous in late season; **petiole** short, obscurely jointed; **stipules** 3–6 mm. long, 2-cleft, eventually lacerate; **nodes** slightly swollen; **stems** terete or lightly grooved, freely branching and mat-forming usually prostrate, arising from a wiry **taproot** ($2n = 40$).

Infraspecific Variability: Like *P. aviculare* L., with which it is often confused, this species varies in flower color and habit; flowers may produce elongate, pale achenes which protrude from the perianth in late season; although leaves are relatively uniform in size throughout the plant, they may grade in size with the season or under severely dry conditions, and the older ones may drop; shoot dimorphism may also occur if the substrate varies, such as when both dark soil and sidewalk are under different parts of the same plant; robust, ascending shoots have also been observed in moist, early winter.

Importance: This species is an extremely common weed in city streets and sidewalks, with amazing capabilities for survival; it is an accepted article in the international pharmaceutical market; however, its confusion with *P. aviculare* confounds the problem of identifying its specific properties; it is harvested in quantity in the U.S.S.R. for market; known variously in Europe as *Herba polygoni*, Homeriana Tea, *Herba sanguinariae* and Blutkraut, its medicinal properties are ascribed to tannins; the stiptic, anti-hemorrhagic properties are as in *P. aviculare*. It is also food for upland gamebirds and is used in some countries as fodder and birdseed.





16. *Polygonum neglectum* Besser

Common Name: Knotgrass

Type Description: Besser, Enum. Pl. Huc. Volh. etc., p. 45, 1822

Synonyms: *P. aviculare* var. *angustissimum* Meisn., *P. provinciale* Koch. (of N.Y. authors)

Origin: Introduced from Europe

Habitats: Disturbed, sandy ground of roadsides, pastures

Habit: Slender-stemmed, spreading, prostrate to ascending annual

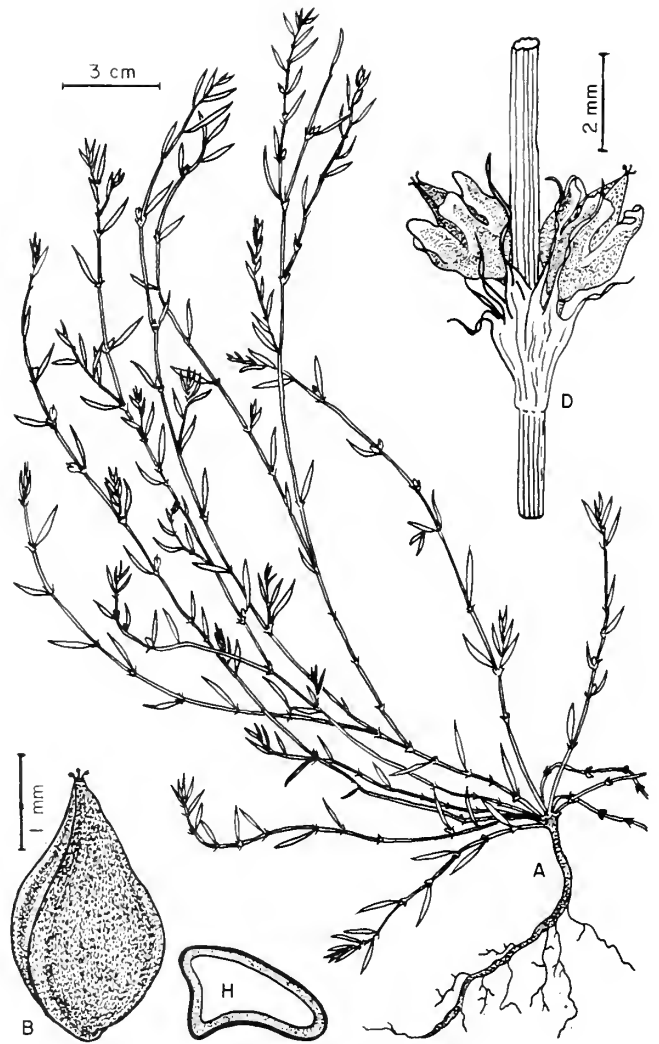
Flowering: May–October

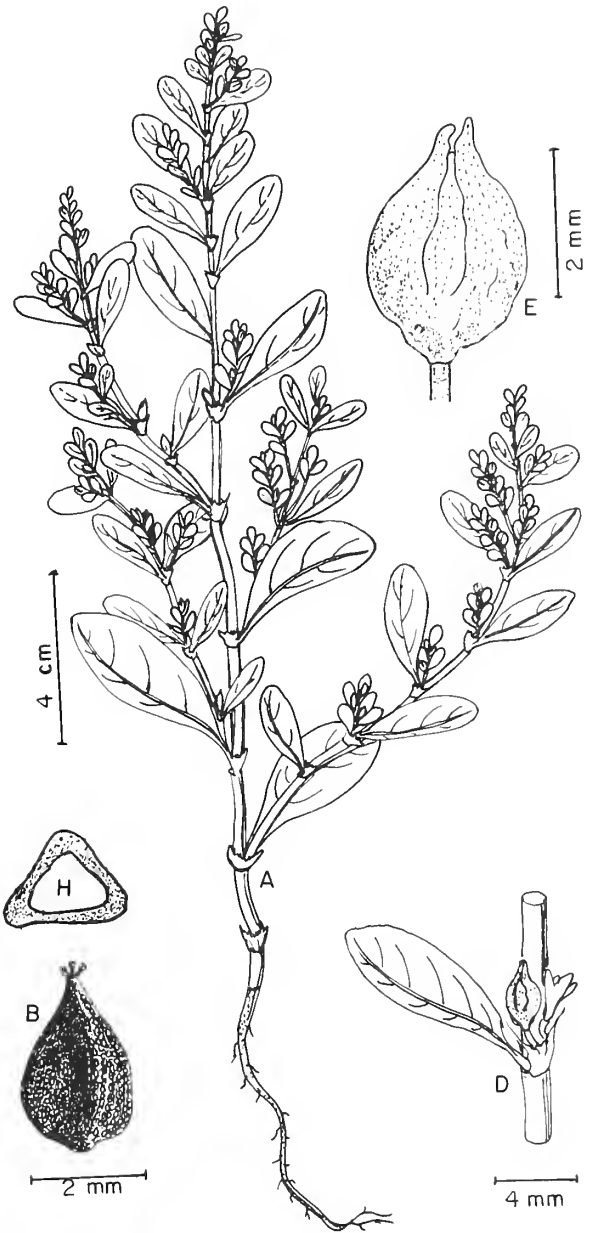
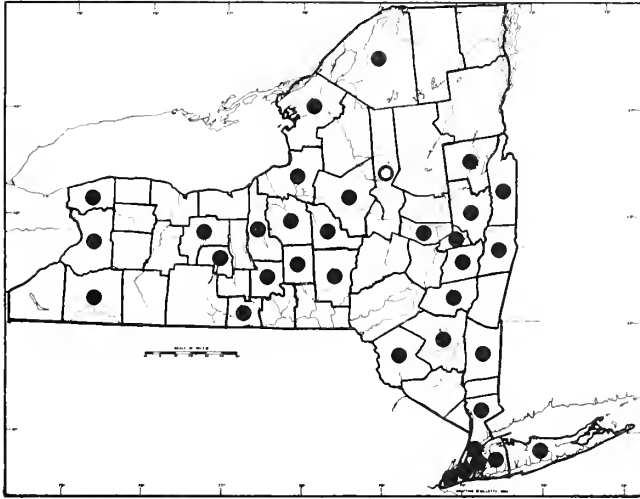
General Distribution: Eastern Europe and adjacent Asia; introduced in North America and Western Europe

Description: Plants with bisexual flowers; stigmas 3; styles 3, short; ovary 1, becoming a trigonous achene; achene 2.1–3 mm. long, often exserted from the persistent perianth, with 2–3 concave sides, apex acute, base somewhat stipitate, surface punctulate, lusterless except the edges; stamens 8 (5–7): filaments dilated at the base, anther sacs yellow, not exceeding the perianth; perianth 2.0–3 mm. long, divided to or below the middle into 5 petaloid lobes; lobes narrow, obtuse to spatulate-rounded, often ascending and not overlapping in fruit, greenish white or usually roseate; bracts pellucid, enveloping the young flower; inflorescences 2–3 flowered fascicles, barely exserted from the sheathing stipules in leaf axils; leaves subequal, green to reddish (prone to fall coloration) acute, narrow, linear-oblong to linear-lanceolate, 8–30 mm. long; petioles very short, jointed; stipules prominent, hyaline, lacerate with age; nodes slightly swollen; stems slender, flexuous, terete, up to 30 cm. long, arising from a wiry taproot (2n = 40).

Intraspecific Variability: This species tends slightly toward heterophylly, making it doubtfully distinct from *P. aviculare*; however, the flowers are more like those of *P. arenastrum*. To complicate matters further, extreme flowers with roseate lobes and exserted achenes appear identical to those illustrated for *P. rurivagum* Jord., a heterophyllous species reported by Löve and Löve (1956) to be introduced into North America.

Importance: It is an insignificant weed with a few scattered locations in the State.





17. *Polygonum erectum* L.

Common Names: Upright or Erect Knotweed

Type Description: Linnaeus, Species Pl., p. 363, 1753

Synonyms: *P. aviculare* var. *erectum* (L.) Roth, *P. aviculare* var. *laterale* Michx.

Origin: North America

Habitats: Waste ground, clearings, forest margins

Habit: Erect to spreading, branched annual

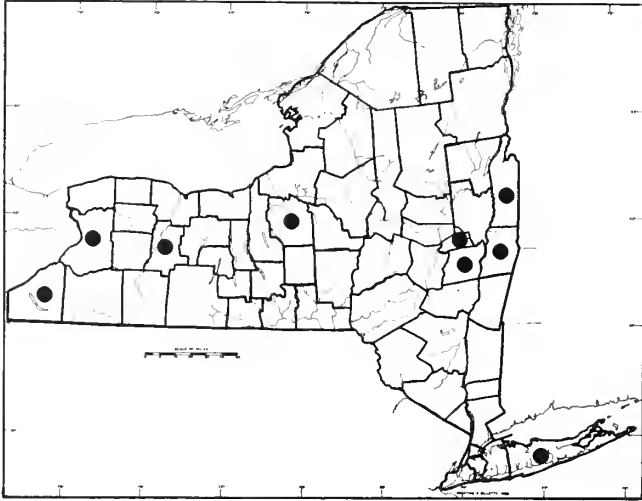
Flowering: June–September

General Distribution: Most of the United States and Southern Canada

Description: Plants with bisexual flowers; **stigmas** 3; **styles** 3, very short; **ovary** 1, becoming a trigonous **achene**; achene about 3 mm. long, enclosed in the persistent perianth, (achene) with 3 ovoid, concave sides, apex acute, base minutely stipitate, surface brown, striate-punctate; **stamens** 5–8: filaments dilated at the base, anther sacs yellow, not exceeding the perianth; **perianth** about 3–3.5 mm. long, parted to below the middle into 5 petaloid lobes; **outer lobes** cucullate and slightly keeled, inner ones narrow, flattened; **flowers** yellow-green; **bracts** pellucid, enveloping the flower bases; **inflorescences** axillary, 2–3 flowered; pedicels erect, exerted when mature; **leaves** green to bright yellow-green, elliptic to ovate with rounded to obtuse tips; plants becoming strongly **heterophyllous** with maturity, leaves of the main branches 2.5–6 cm. long, 1–3 cm. wide, much reduced on lateral branches; **petioles** short, jointed but seldom deciduous; **stipules** 5–10 mm. long, sheathing, becoming lacerate; **nodes** slightly swollen; **stems** terete, sulcate, erect or spreading, rarely up to .75 m. tall, arising from a wiry **taproot** ($2n = 40$).

Infraspecific Variation: Young plants with few flowers produce the larger leaf type in high proportion and may appear homophyllous at that stage; mature plants, however, are extremely heterophyllous.

Importance: As in other Knotweeds, it is reported for its astringent and stiptic properties when a decoction is made. It has also been used as a gargle and laxative.



18. *Polygonum buxiforme* Small

Common Name: Knotweed

Type Description: Small, Bull. Torrey Bot. Club, 33:56, 1906

Synonyms: *P. littorale* Link, *P. aviculare* var. *littorale* (Link) Koch, *P. aviculare* var. *crassifolium* Lange

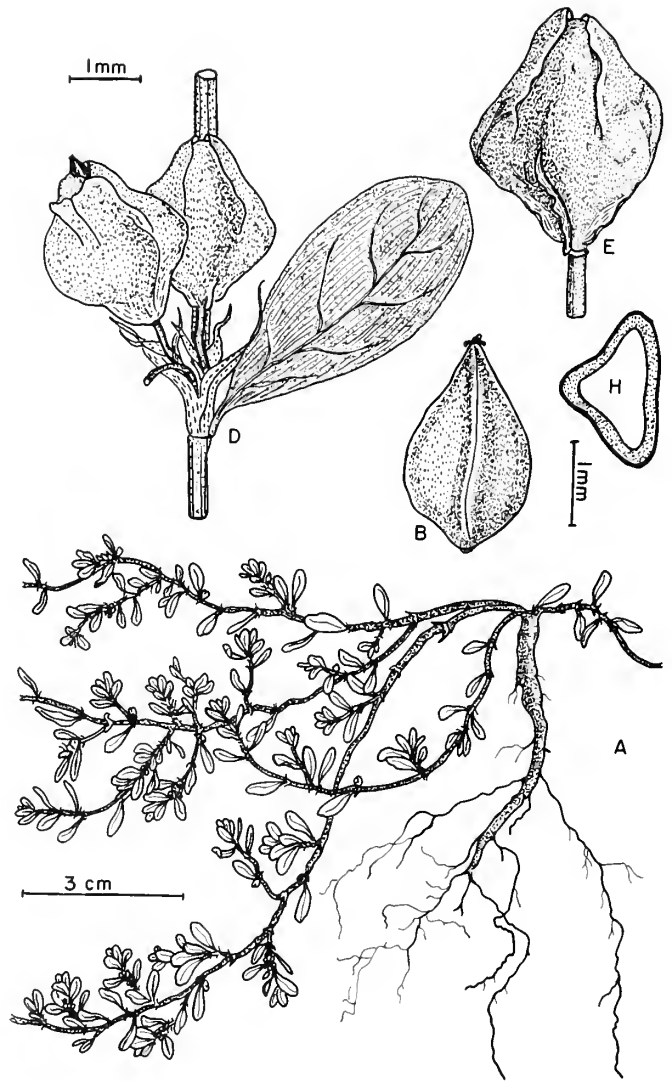
Origin: North America

Habitats: Packed, nondrifting sands, dune and marsh borders and inland sandy soils

Habit: Generally a completely prostrate, much-branched, mat-forming plant

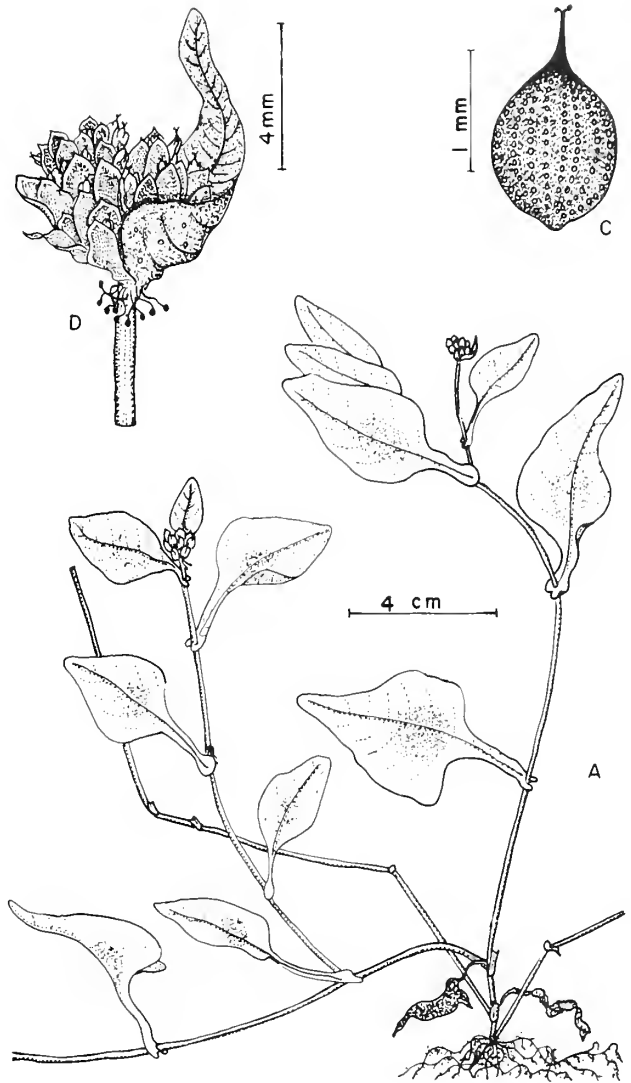
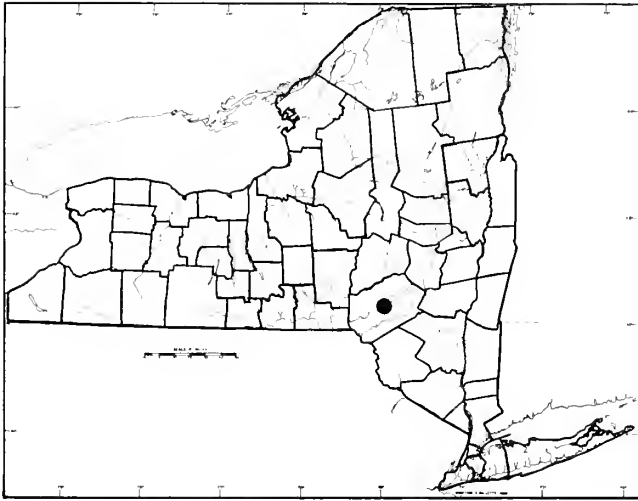
Flowering: June–October

General Distribution: Coastal and inland in the Eastern and Midwestern United States



Description: Plants with bisexual flowers; stigmas 3; style 3-cleft to near the base, .2 mm. long; ovary 1, becoming a trigonous achene; achene ovoid, 2–2.8 mm. long, 1.5–2 mm. wide, generally included in the fruiting perianth, usually with 2 concave and one broader, less concave side, apex acute, lower portion tapering somewhat to the slightly stipitate base, the surface light to dark brown, striate-punctate, shiny at the edges (or shiny surfaces and dull edges); stamens 8: inner filaments dilated, outer adnate to the perianth; perianth 2–3 mm. long, divided to below the middle into 5 petaloid lobes which are greenish with white to roseate margins, lobes cucullate, lower perianth asymmetric with a pouch-like protrusion, often with slight wings and protruding veins; bracts sheathing, pellucid to silvery, inside the stipules; inflorescences 2–6 flowered fascicles, barely exerted from the stipules in leaf axils; plants homophyllous; leaves bright to gray-green or glaucescent, oblong to oblanceolate, 3–20 mm. long, 1–8 mm. wide, apex obtuse or rounded, base tapering to a short petiole, margins often crinkled; petioles short, jointed; stipules 2-cleft, 4–5 mm. long, reddish-brown with hyaline extremities; nodes slightly swollen; stems prominently ridged, woody at the lower internodes, usually completely prostrate, branches up to 5 m. long, arising from a very stout, woody taproot ($2n = 20, 60$).

Note: This species has been confused with *P. aviculare*, but has the characteristic cucullate lobes of native American species. The chromosome counts and unusual coastal and disjunct inland distributions put its relationships clearly with the *P. ramosissimum* complex.



19. *Polygonum nepalense* Meisn.

Type Description: Meisner, Monogr. Pol. Prod., p. 84, 1826

Synonym: *P. alatum* Hamilton ex D. Don.

Origin: Nepal, central Asia

Habitats: Moist, wooded banks, streamsides

Habit: Ascending, annual herb

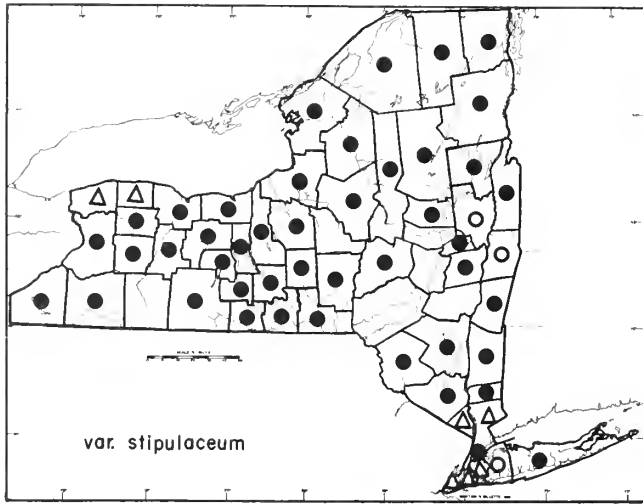
Flowering: July–October

General Distribution: Asian native, introduced in Russia, eastern Europe, Connecticut and the New York Catskills

Description: Plants with bisexual flowers; **stigmas** 2, capitate; **styles** 2, filiform; **ovary** 1, becoming a lens-shaped **achene**; achene red-brown with a finely reticulate surface of beady ridges, 1.5–2 mm. long, about 1 mm. wide, included in the persistent **perianth**; **stamens** 8, blackish purple; **perianth** about 2–2.2 mm. long, greenish-white to lavender or purple, 5-lobed; **pedicels** short; **bracts** greenish-white, equaling or exceeding the flowers in length; **inflorescences** capitate heads, usually with 8–30 flowers; **peduncle** with a tuft of glandular hairs at the base; **leaves** variable in size, 1–9 cm. long, ovate to deltoid with acuminate tips and truncated bases, but with the blades extending down the petioles as **wings** which clasp the stem; leaves pale green, red splotched, with tiny, yellow glandular dots; the winged **petioles** variable in length from 2–30 mm.; **stipules** scarious, associated with a tuft of hairs at the petiole base; **nodes** slightly swollen; **stems** laxly ascending from a tufted, annual **rootstock**.

Note: This species is reported from Connecticut (Fernald, 1950) and has now been found by Karl Brooks in three locations in the New York Catskills. It appears much like a native where it occurs.

Importance: The plants have been grown as a ground cover for shady yard areas and around gardens. The pale green leaves can be striking with their splash of red-purple.



20. *Polygonum amphibium* L.

Common Name: Water Smartweed

Type Description: Linnaeus, Species Pl., p. 361, 1753
Synonyms: *P. natans* Eat., *P. coccineum* Muhl., *P. fluitans* Eat., *P. hartwrightii* A. Gray, *P. inundatum* Raf., *P. muhlenbergii* S. Wats.

Origin: Uncertain, due to its almost cosmopolitan distribution; the center of diversity is in North America
Habitats: A great number of aquatic situations, dry lakebeds and dunes

Habit: Amphibious or emergent, polymorphic species with three intergrading varieties and a number of land and water modification-types: floating, prostrate, ascending or erect . . . spreading by rhizomes and stolons

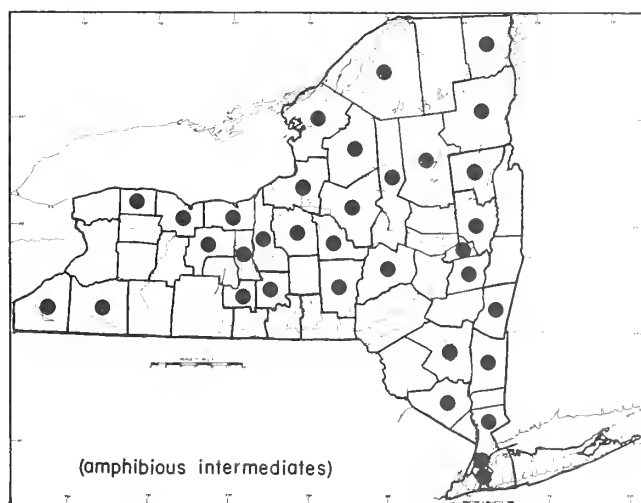
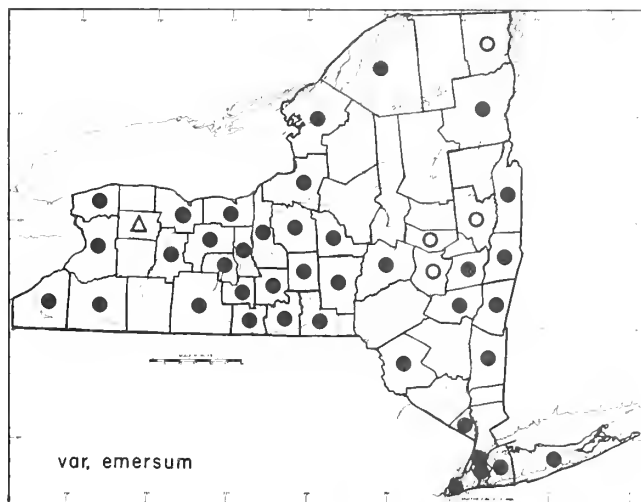
Flowering: June–October (New York)

General Distribution: The typical variety is circum-boreal and in South Africa; in North America it intergrades with two extreme varieties; all three occur in New York State along with intermediates

Description: Plants functionally dioecious (polygamous) with dimorphic flowers; **stigmas** 2, capitate; **styles** 2, united to near the summit, either 1–2 mm. long or 3–4 mm. long in flowers with short stamens; **ovary** 1, becoming a lens-shaped **achene**; achene ovoid-orbicular, highly glossy, dark brown to black, 2.5–3.2 mm. in diameter; **stamens** 8, either 4–6 mm. long, exerted, or 2–3 mm. long with collapsed anther sacs in flowers with long styles; **perianth** 4–5 mm. long with 5 bluntly rounded lobes, cut to below the middle, pink to rose or occasionally scarlet, enclosing the mature achene; **bracts** sheathing, scarios; **inflorescences** usually single or in pairs at the tips of major branches, stout, spike-like panicles, ranging from 1–2 cm. broad,



and from 2–15 cm. (18) long, depending on the variety; **peduncles** stout, grooved, variably glandular-pubescent to glabrous; **leaves** 3–35 cm. long, varying in shape and size with conditions; **floating leaves** glabrous, elliptic, with rounded tips to broadly cordate with acute tips, their petioles 10–80 mm. long; **subaerial leaves** elliptic oblong (obtuse tips) to lanceolate acuminate, their petioles 1–25 mm. long, pubescence ranging from scabrescent to pilose, from a mixture of simple and branched hairs of variable length; **stipules** 1–5 cm. long, varying with the habitat: **submerged stipules** obliquely sheathing, glabrous and opaque to silvery; **subaerial stipules** strongly tubular-sheathing, green when young and often developing a chlorophyllous collar or flange at the margin in early season; late-season stipules and those of the non-amphibious variety often lack these, turn brown and shatter; **stipule margins** may or may not have a fringe of bristles; **nodes** are often conspicuously swollen; **internodes** are extremely short in some terrestrial forms, but up to 30 cm. long in the stolons of mat-forming aquatics; **stems** are decumbent, floating, ascending or erect, depending on conditions, up to 2 m. in var. *emersum*, from slender to tough, woody **rhizomes** up to 2 cm. in diameter ($2n = 96, 98$).

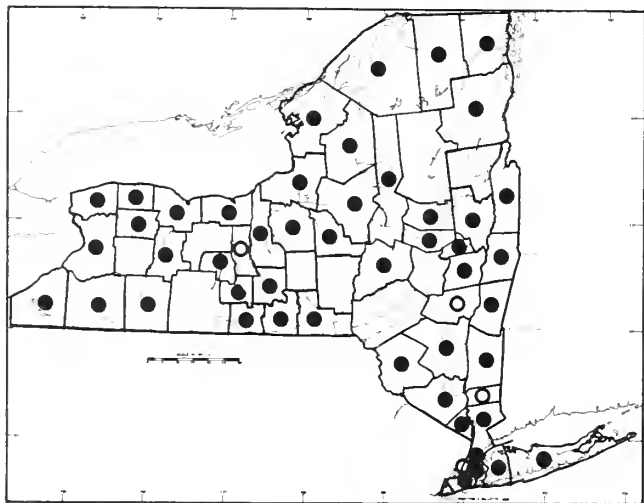


Infraspecific Variability: These aquatic plants assume so many postures and character-combinations that there has been considerable confusion and the application of over 100 species names. They appear to represent a cline of phenotypic variability from the most amphibious to the least (Mitchell, 1968, 1976). This corresponds to a morphological gradient with var. *stipulaceum* Colem. at one end, var. *emersum* Michx. at the other, and a broad range of intermediates, some of which are indistinguishable from Eurasian var. *amphibium*. The flared collar on the stipule of landforms is a seasonal character, found only in North American plants. This character alone keeps many amphibious intermediates from fitting the description of typical var. *amphibium*. Although no single character has been shown to distinguish the intergrading varieties, they are often quite different in appearance in the field. The following descriptions are offered for their separation, since a key is impractical:

- P. *amphibium* var. *stipulaceum* Colem. Typical plants flower in the water, not on land; inflorescences are 4 cm. long or less and leaves are glabrous, floating, elliptic; the landform is dwarfed, sprawling, quite pubescent, stipules flanged; the most highly adapted hydrophyte.
- P. *amphibium* var. *emersum* Michx. Typical populations flower from strongly erect or emergent plants which are often quite robust; floating shoots and leaves are not produced; inflorescences are from 4–15 cm. long, and leaves are acuminate tipped, frequently with undulating margins; peduncles are glandular-pubescent in contrast to the former variety which only has this character occasionally when stranded away from water; stipules are not flanged with a collar, but turn brown at the margin and shatter; the most poorly adapted hydrophyte, but well adapted to temporarily moist situations: ditches, sloughs, rice fields as a weed.
- P. *amphibium*, varietal intermediates (including var. *amphibium* in North America). Typical plants are amphibious, surviving and flowering almost equally well as floating, stoloniferous plants or ascending, rhizomatous plants of the banks; flowering is more prolific in the water where the floating leaves are obtuse or acute at the tips and usually slightly cordate at the bases; land plants are quite variable in leaf shape and pubescence; peduncles usu-

ally are glabrous on the floating shoots and glandular on those flowering on land; stipules in typical var. *amphibium* are not flanged, but many intermediates show this character; inflorescences 3–13 cm. long on the floating shoots, usually shorter on land; this is the entity which spans the gap in every character between the formerly described taxa.

Importance: The plants are harvested and dried for cattle and pig fodder in Western United States; in Thailand and other Asian countries this species (along with Water-hyacinth) is grown in ponds where swine feed on it; it has been used as a source for the flavanoid, rutin. Ecologically it is important as a food for waterfowl. It has the capability of invading impoundments and changing the ecosystem very quickly by its spread over the surface. In Europe the rhizomes are leached and the liquid substituted for sarsaparilla.



21. *Polygonum lapathifolium* L.

Common Names: Willow-weed, Dock-leaved or Pale Smartweed

Type Description: Linnaeus, Species Pl., p. 360, 1753

Synonyms: *P. scabrum* Moench., *P. tomentosum* Gray, *P. incarnatum* Ell., *P. nodosum* Pers.

Origin: Introduced from Europe; possibly native, in part

Habitats: Disturbed soils and moist places

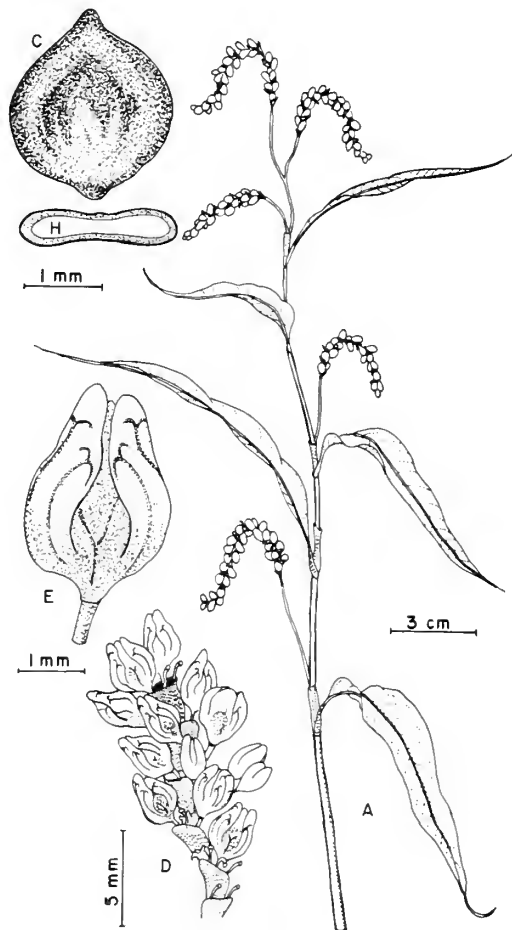
Habit: Erect, ascending or prostrate in soil, gravel or on sidewalks

Flowering: June–October

General Distribution: Widespread weed, circumboreal

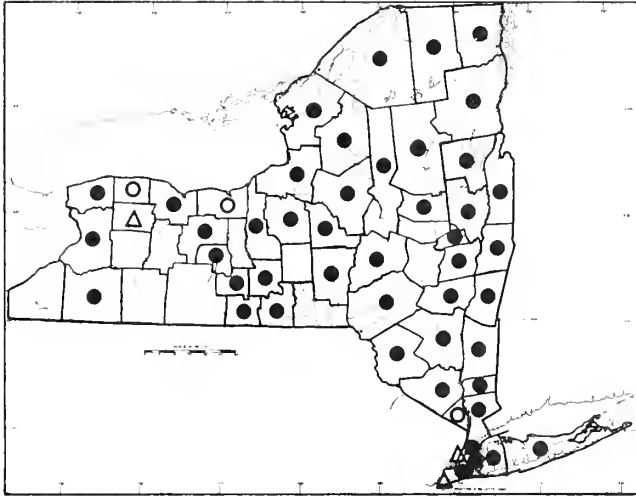
Description: Plants with bisexual flowers; stigmas 2; styles 2, barely united at the base; ovary 1, becoming a lens-shaped achene; achene brown to black, lustrous, flattened with one slightly concave side, 1.8–2.8 mm. long, enclosed in the persistent perianth; stamens usually 6, included in the perianth; perianth 4 (5) lobed to below the middle, pinkish to white or green with a silvery sheen, 2.4–3.8 mm. long, constricted above the achene; most lobes with prominent, anchor-shaped veins; bracts oblique, scarcely tubular, entire or with a few short bristles; inflorescence 0.5–1.1 cm. wide, 1–7 cm. long, a spike-like panicle which is often nodding when elongate; peduncles glabrous or sparsely glandular; leaves usually lanceolate-acuminate, but varying from oblong-ovate to lance-linear, 5–25 cm. long, sometimes glandular dotted; pubescence ranging from none to sparse hairs and glands or even densely tomentose on the under surfaces; petioles 0.3–3.5 cm. long, glabrous to glandular-pubescent; stipules obliquely tubular with entire or lacerate margins; nodes swollen, especially the lower ones; internodes hollow; stems strongly erect-ascending to decumbent, up to 2.5 m. tall, from a twisted, annual taproot ($2n = 22$).

Intraspecific Variation: Pale-leaved, semi-prostrate plants are to be found on gravel heaps and in sidewalk cracks; these often have pronounced purple-brown splotches on the leaves. According to Timson (1963), characters used to distinguish species such as *P. nodosum* and *P. tomentosum* actually are found in all combinations in separate in-



breeding lines; the variable properties are: red-spotted stems, yellow or pellucid glandular dots, tomentose leaves and anthocyanin in the perianth; inflorescence length and nodding, as well as peduncle glands are also sources of variation.

Importance: This species is a rank weed in disturbed situations throughout the Northern Hemisphere. Its value as a food for waterfowl is notable, but not as significant as in some other species.



22. *Polygonum pensylvanicum* L.

Common Names: Pinkweed, Smartweed

Type Description: Linnaeus, Species Pl., p. 362, 1753

Synonyms: *P. bicorne* Raf., *P. longistylum* Small (also misspelled *P. pennsylvanicum*)

Origin: Native, North American

Habitats: A great number of disturbed situations, including cultivated fields

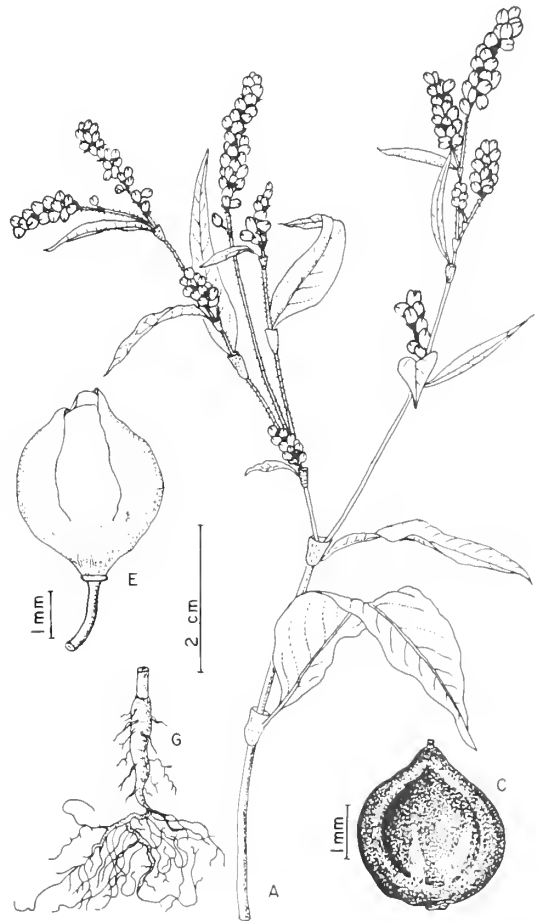
Habit: Coarse, erect annual forming patches (rarely decumbent)

Flowering: June–October

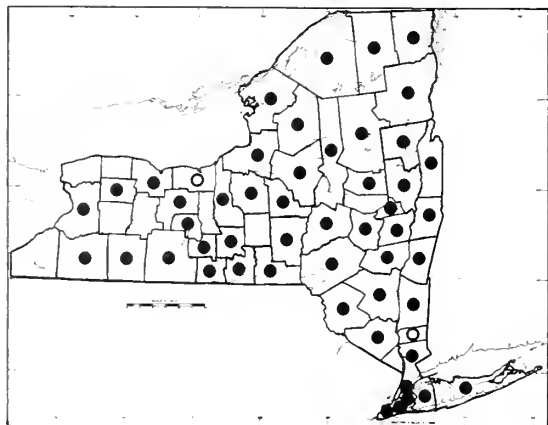
General Distribution: Throughout North America

Description: Plants with bisexual flowers; stigmas 2, capitate; styles 2; ovary 1, becoming a lens-shaped achene; achene ovoid in outline, flattened and indented on one or both sides, 2.5–3.4 mm. long, brown to black, shiny but minutely roughened; stamens usually 8, attached in the sinuses and at the edge of a lobed, glandular disc at the base of the ovary; styles and stamens not exceeding the perianth (in ours); perianth 5-lobed, divided to below the middle, 3–4 mm. (6 mm.) long, pink to rose (rarely white), enclosing the achene; bracts acute-tipped, sheathing, entire or minutely ciliate; pedicels exserted; inflorescence a dense, cylindrical, spike-like panicle, 1–1.5 cm. wide, 1.8–5 cm. long (usually about 3 cm.); peduncles with glands, hairs, combinations or completely glabrous; leaves broadly to narrowly lanceolate with acute to acuminate tips and obtuse to acute bases, 3–20 cm. long, 1–6 cm. wide, with variable pubescence ranging from nearly glabrous to densely hispid or glandular; petioles 3–15 mm. long joining smoothly with the stipules; stipules tubular-cylindric, many veined, sparsely pubescent or usually glabrous with no marginal bristles, soon lacerate, 1–1.5 cm. long; nodes conspicuously swollen; internodes hollow, strigose or glandular toward the plant apex (rarely glabrous); stems erect-ascending, up to 2.3 m. tall (rarely decumbent), main axis from a stout taproot.

Intraspecific Variability: A number of varieties have been named on the basis of pubescence, glands, flower size and color. The prostrate form has also been recognized as a variety. The most common type in New York is var. *laevigatum* Fern. in which peduncles are glandular and leaves are almost glabrous beneath. In southern and western states the inflorescences of many populations are quite narrow and elongate; heterostylous populations have also been recognized as species. This polymorphic group is in need of further study.



Importance: This species is one of the more important to wildlife, with large, nutritious achenes produced in abundance, the plants form large colonies in ecotones where upland gamebirds find both protection and food; they also occur in cultivated fields and wet places where migratory waterfowl may find them; they are planted by hunting clubs across the country; Pinkweed has been used along with *Lespedeza* as an early crop for roadcuts which need stabilization while a perennial soilbinder establishes; as a native plant, now spreading as a weed, it should not be discouraged where it might be replaced by far less attractive and useful opportunists.



23. *Polygonum hydropiper* L.

Common Names: Common Smartweed, Water Pepper

Type Description: Linnaeus, Species Pl., p. 361, 1753

Synonym: *Persicaria hydropiper* (L.) Opiz.

Origin: Eurasia

Habitats: A great variety of moist and disturbed situations including fields and meadows

Habit: Erect to sprawling

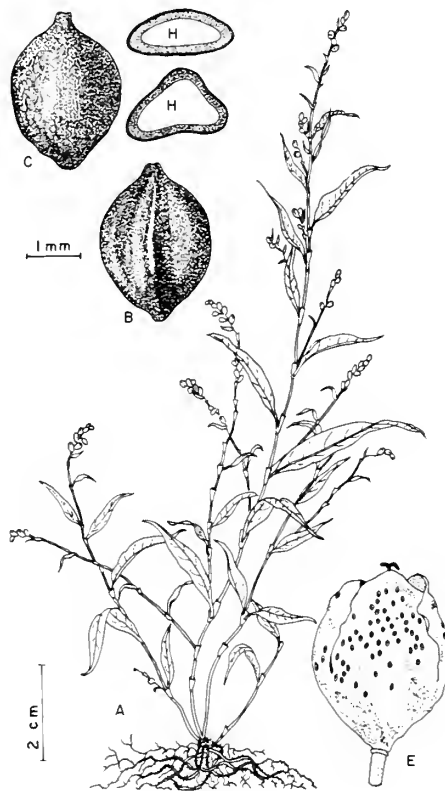
Flowering: June–October

General Distribution: A circumboreal weed

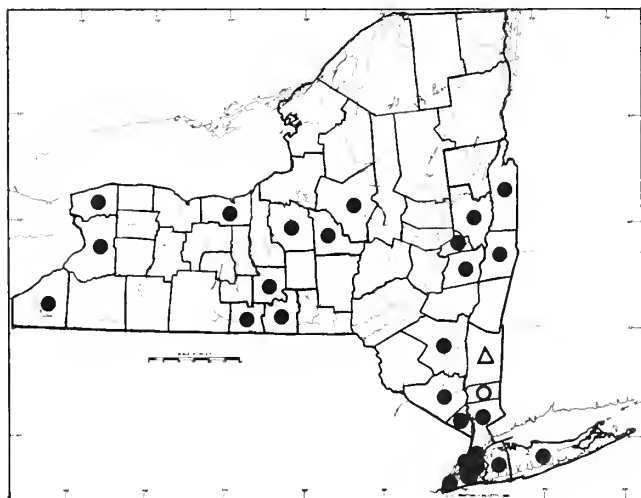
Description: Plants with bisexual flowers (mostly cleistogamous); **stigmas** (2) 3, capitate; **styles** (2) 3, short; **ovary** 1, developing into a lens-shaped or more frequently 3-angled **achene**; achene powdery to dark brown, surface dull, 2–3.5 mm. long, enclosed in or slightly exerted from the perianth; **stamens** 6–8, included; **perianth** 4 (5) lobed to below the middle, 2.5–4.5 mm. long, outer lobes cucullate, greenish with creamy margins, often with roseate blush, covered with glandular dots (valvate chambers) which are yellow-green and turn brown upon drying; **bracts** sheathing and usually overlapping-turbinate, green to pink with entire or weakly ciliate margins; **inflorescences** numerous, 0.3–7.5 cm. long, slender, spike-like panicles and smaller clusters borne from the nodes within the sheathing stipules; **peduncles** variable in length, usually glabrous; **leaves** lanceolate, 1–16 cm. long, 0.3–2.0 cm. wide, reduced in size upward on the plant continuing into the inflorescence as foliaceous bracts, pubescent with short, stiff hairs along the margins and a few veins, otherwise glabrous, punctate on both surfaces, anthocyanin rich, tending to color with age; **petioles** 1–5 mm. long with a few hairs, joined near the bases of the stipules, strongly veined in transition; **stipules** tubular-cylindric with scabrous surfaces and slender marginal bristles, 1–6 mm. long, browning and shattering with age, 1–1.5 cm. long; **nodes** swollen; **internodes** hollow, surfaces usually glabrous; **stems** up to 1 m. high, spreading-erect to sprawling, single to **many-stemmed**, branching profusely near the base, from a fibrous, annual **root system** ($2n = 20, 22$).

Intraspecific Variation: North American plants have been segregated as var. *projectum* Stanford, but do not differ from European populations significantly. Perennials have been reported, but these probably represent improperly identified specimens of *P. punctatum* Ell., which is similar.

Importance: In Europe an extract has been used medicinally for centuries, due to its irritant properties, which can alter a number of medical symptoms. The oily exudates, which are produced throughout the plant in multicellular glands (valvate chambers), are released onto the epidermis and repel most foraging animals; this irritation can be extreme, causing temporary blindness if wiped directly in the eyes. The name, Smartweed, derives from this char-



acteristic. Songbirds and waterfowl, however, feed enthusiastically on the achenes. The old name, Water Pepper, comes from the occasional use of the achenes by Europeans as a substitute for ground pepper in seasoning. Polygonic acid is given credit for the exudate's irritant properties. The extract was used in the 18th century as a yellow dye for wool. In America an extract of fresh plants has been tried with mixed, and often doubtful results, as a stimulant, vesicant, anti-venereal, laxative, cold cure, desiccant, cholera treatment, diuretic, and soak for rheumatics. It has been used externally for inflammations, bruises, ulcers and hemorrhoidal inflammations, also in shrinking gangrenous tissue; as a general cure-all, it has been included in a number of panaceas, sold in medicine shows in the 19th century. Fresh juice was claimed to help with jaundice and dropsy; the root was chewed for toothache, probably as a distraction. All of these claims should be carefully scrutinized, and the extract of Smartweed should be treated with caution for what it is . . . a strong irritant and astringent. As a weed, this species is a common inhabitant of moist, disturbed sites, and has become a problem in some meadows and cultivated fields; it is controlled through weeding and increased soil drainage.



24. *Polygonum orientale* L.

Common Names: Prince's-feather, Kiss-me-over-the-garden-gate, Baton de St. Jean, Monte-au-ciel

Type Description: Linnaeus, Species Pl., p. 362, 1753

Synonym: *Persicaria orientalis* (L.) Spach

Origin: Native of India, introduced as an ornamental

Habitats: Moist and disturbed ground as an escape

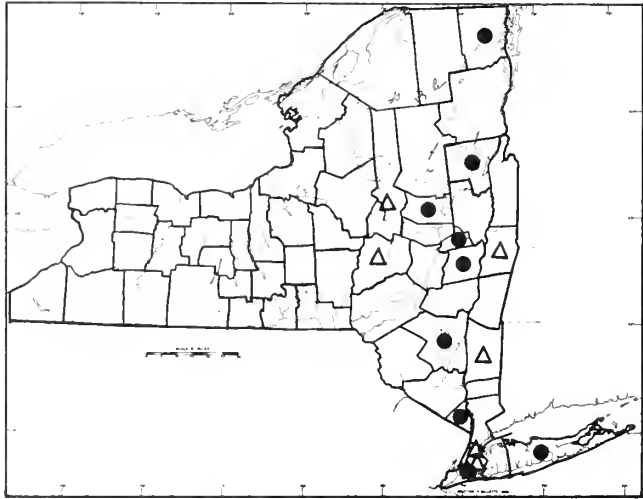
Habit: Tall, erect, branching annual

Flowering: June–October

General Distribution: Circumboreal weed and cultivar

Description: Plants with bisexual flowers; **stigmas** 2, capitate; **styles** 2; **ovary** 1, becoming a biconvex **achene**; achene orbicular, turgidly lens-shaped or indented on one or both sides, dark brown to black, semi-lustrous, 2.5–3.2 mm. long and broad, included; **stamens** 6–8, included or slightly exerted; **perianth** 5-lobed to below the middle, pink to deep rose, 3–4.5 mm. long, enclosing the achene; **bracts** ovate with acute to obtuse tips, usually overlapping, minutely strigose on the surfaces with bristles on the margins; **inflorescence** a spike-like panicle about 1 cm. wide and up to 12 cm. long, often lax or slightly drooping; **peduncles** 2–5 cm. long, densely pilose-tomentose; **leaves** ovate, commonly acuminate tipped and slightly truncated below, 3–16 cm. wide, 6–25 cm. long, drastically reduced upward on the stem, minutely strigose to densely tomentose, especially on the lower veins; **petioles** ribbed or slightly winged, 1–8.5 cm. long, densely pilose-hispid; **stipules** 1–1.5 cm. long, tubular-sheathing, densely strigose to hispid with marginal bristles, scarious, sometimes with a flared, chlorophyllous flange at the summit; **nodes** swollen; **internodes** pilose-hispid, terete or grooved; stems up to 2.5 m. tall from a tough, annual **rootstock** ($2n = 22, 24$).

Importance: The plants are cultivated as garden annuals, and occasionally escape and persist as weeds of moist, waste places and vacant lots.



25. *Polygonum careyi* Olney

Common Names: Smartweed, Pinkweed

Type Description: Olney, Proc. Prov. Frankl. Soc., 1:29, 1847

Synonym: *Persicaria careyi* (Olney) Greene

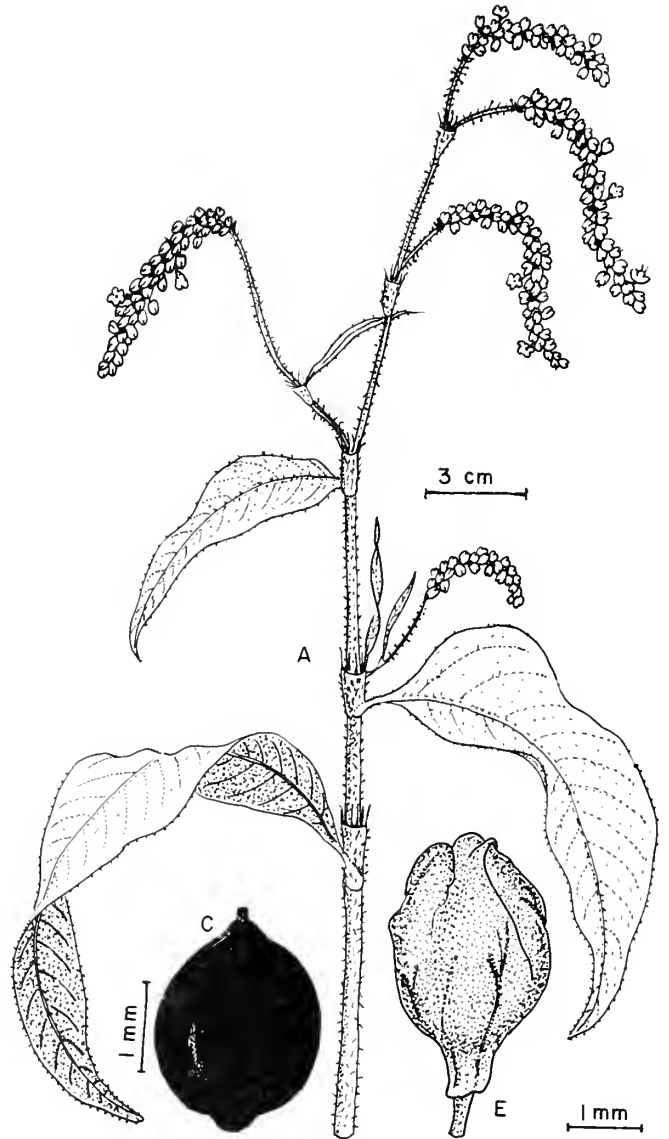
Origin: Northeastern North America

Habitats: Moist ground, fields, meadows thickets, riverbeds and other disturbed soils

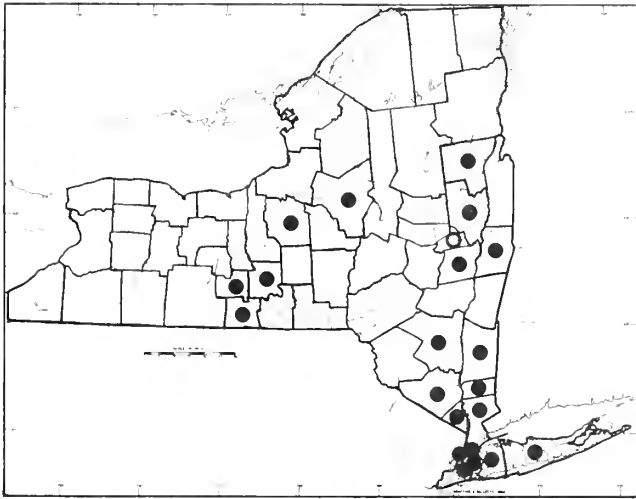
Habits: Erect-ascending, robust annual (dwarfed on gravel)

Flowering: July–October

General Distribution: Maine to Minnesota, Delaware to Indiana



Description: Plants with bisexual flowers; stigmas 2, capitate; styles 2; ovary 1, becoming a lens-shaped achene; achene obovoid, lustrous, dark brown to black, 1.8–2.5 mm. long, nearly as wide; stamens 5 (8) not exerted; perianth 5-lobed, pink to dark rose or purplish, 2.4–3.2 mm. long, parted to below the middle, enclosing the mature achene; pedicels exerted from the bracts; bracts sheathing with ciliate margins; inflorescences spike-like panicles, loosely flowered and sometimes lax or slightly drooping, 3–10 cm. long; peduncles strongly glandular-pubescent, variable in length; leaves narrowly lanceolate, 6–18 cm. long, 1–3 cm. wide, attenuated at both ends, pilose to scabrous; stipules tubular-cylindric, bristled at the margins and occasionally slightly flanged, scabrous to hirsute or slightly glandular; nodes swollen; internodes densely glandular-stipitate, especially the upper ones, also with hairs among the glands; stems up to 1.5 m. tall, usually erect branching from an annual rootstock.



26. *Polygonum cespitosum* Blume

Common Name: Smartweed

Type Description: Blume, Bijdr., p. 532, 1825

Synonyms: *P. longisetum* DeBruyn (also spelled *P. caespitosum*), *P. posumbu* Hamilt.

Origin: Southeastern Asia

Habitats: Moist places and disturbed ground

Habit: Erect to spreading-procumbent, annual

Flowering: June–October

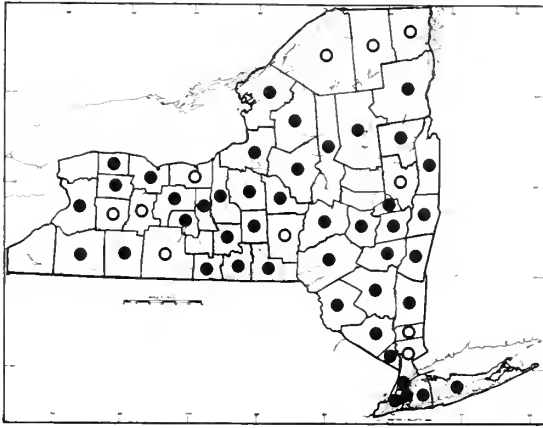
General Distribution: Eastern Asia, weedy in Europe, New England to the Carolinas and Midwestern United States



Description: Plants with bisexual flowers; **stigmas** 3, capitate; **styles** 3; **ovary** 1, becoming a 3-angled achene; achene 2–2.5 mm. long, lustrous, dark brown to black; **stamens** usually 8, included in the perianth; **perianth** 2.2–2.8 mm. long, dull rose to deep rose-purple with paler lobe margins, 5-lobed to about the middle, enclosing the mature achene; **bracts** sheathing, with long bristles, 2–4.5 mm., exceeding or equaling the flowers in length; **inflorescences** slender, cylindric, spike-like panicles 3–6 mm. wide, 2–4.5 cm. long; **peduncles** slender; **leaves** ovate-lanceolate to rhombic, attenuated about equally at the tips and bases, 2–8 cm. long, 1–2 cm. wide, usually sessile, nearly glabrous above, ciliate on the veins below; **petioles** lacking or extremely short; **stipules** tubular, sheathing, glabrous to strigulose, but with bristles up to 1 cm. in length on the margins, equaling to longer than the stipules themselves; **nodes** swollen; **internodes** slender, glabrous; **stems** branching from near the base, erect to procumbent, from an annual **root**.

Intraspecific Variability: Collections from New York are of the type with long bristles in the inflorescence; these have been designated var. *longisetum* (DeBruyn) Stewart. In Asia the typical variety of the species has shorter bristles. This variety has also been reported as an introduction in the United States and may be encountered.

Importance: A weedy species, rapidly spreading in the United States since the 1940's, it provides some wildlife food and has been planted for the purpose, but it is mostly a pest.



27. *Polygonum persicaria* L.

Common Names: Lady's Thumb, Heart's-ease, Smartweed, Heartweed

Type Description: Linnaeus, Species Pl., p. 361, 1753

Synonyms: *P. puritanorum* Fern. (in the sense of American authors, also *P. dubium* Stein, *P. minus* Huds.)

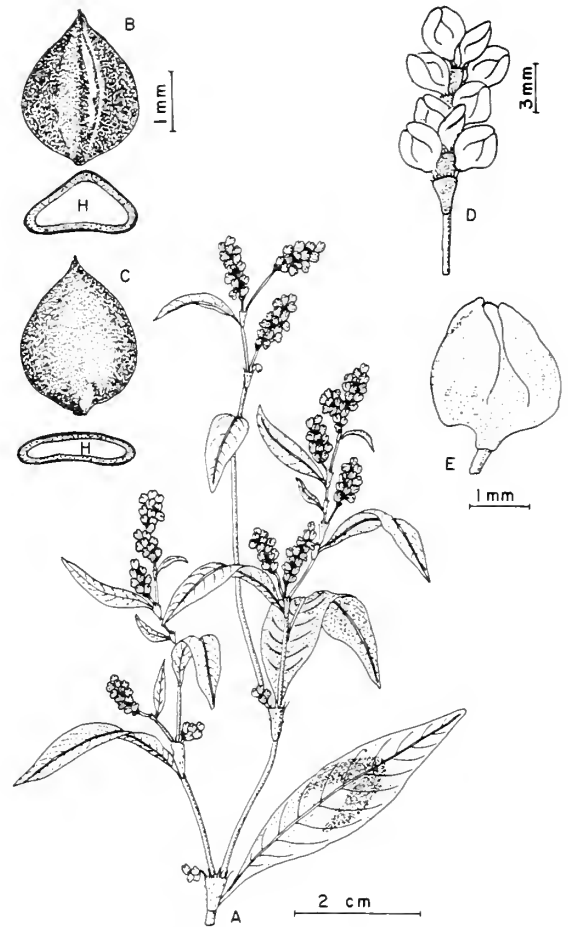
Origin: Europe

Habitats: Disturbed soils and moist areas such as ditches and banks or rivers and lakes

Habit: Erect, ascending, annual weed

Flowering: June–October

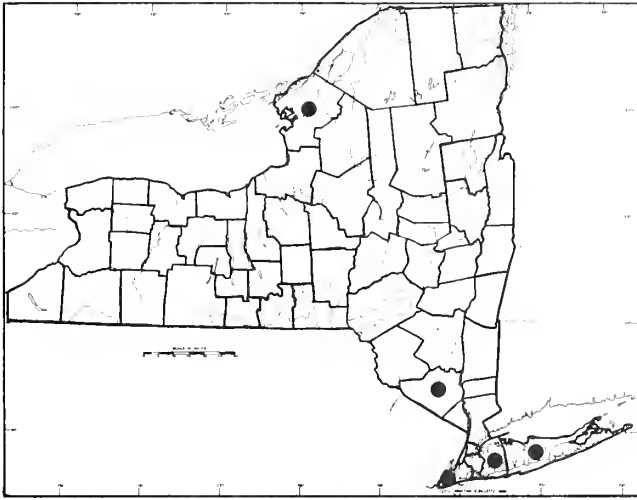
General Distribution: Circumboreal, Alaska to Mexico, Greenland to Florida in North America



Description: Plants with bisexual flowers; **stigmas** 2 (3), capitate; **styles** 2 (3) united at the base; **ovary** 1, becoming a lens-shaped or 3-angled **achene** (in different percentages); achenes ovoid, 2–3 mm. long, brown to black, lustrous, but minutely pitted; **stamens** usually, 6, included or slightly exerted in open flowers; **perianth** 5-parted to below the middle, pink to greenish-purple (rarely white), 2.2–3.5 mm. long, enclosing the achene at maturity; **pedicels** short, included in the bracts; **bracts** sheathing, overlapping margins entire or with few weak cilia; **inflorescences** dense, cylindric, spike-like panicles, 7–12 mm. thick, 1–4.5 cm. (6) long, erect; both long, terminal inflorescences and shorter, scattered ones present at the nodes and on short shoots; **peduncles** glabrous; **leaves** broad to linear-lanceolate, often purple blotched near the middle, 3–15 (20) cm. long, 3–18 (26) mm. wide, sparsely strigose to nearly glabrous, acuminate-acute tipped (rarely obtuse to blunted) tapering at the base; **petioles** short, usually glabrous; **stipules** sheathing, tubular-cylindric, 1–2 cm. long, membranous and strigulose with short, marginal bristles, shattering with age; **nodes** swollen; **internodes** mostly glabrous; **stems** branched up to 1 (1.5) m. tall, from an annual **taproot** ($2n = 44, 40?$).

Infraspecific Variation: There is a great deal of variation in leaf shape and stature of the plants, which has led to description of such taxa as var. *angustifolium* Beckh. and var. *ruderales* (Salisb.) Meisn. Species and varieties have been based in part also on the percentage of 3-angled achenes; however, this character has been shown to be strongly environmentally influenced (Hammerton and Jaliloq, 1970). Large specimens with elongate inflorescences from the streets of New York City resemble Texas populations, and have probably been re introduced at the docks. Inflorescence color and interruption of the spikes have also been used as characters, but show more or less random variation.

Importance: The plants are noxious weeds, but provide food for waterfowl and other birds; they are sometimes sown for the purpose in ponds and estuaries; they spread rapidly by seed in moist areas and also survive on waste dumps and on city streets; the species is perhaps our commonest Smartweed, followed closely by *P. lapathifolium*, with which it is often confused; the leaves are somewhat peppery, and have been used to season cooking; a yellow to grey-brown dye-stuff extracted from this and other species was used in the 19th century.



28. *Polygonum opelousanum* Ridd. ex Small

Common Name: Smartweed

Type Description: Riddell, in Small, Bull. Torrey Bot. Club, 19:354, 1892

Synonyms: *Persicaria opelousana* (Ridd.) Small, *Polygonum hydropiperoides* Michx. var. *opelousanum* (Ridd.) Stone

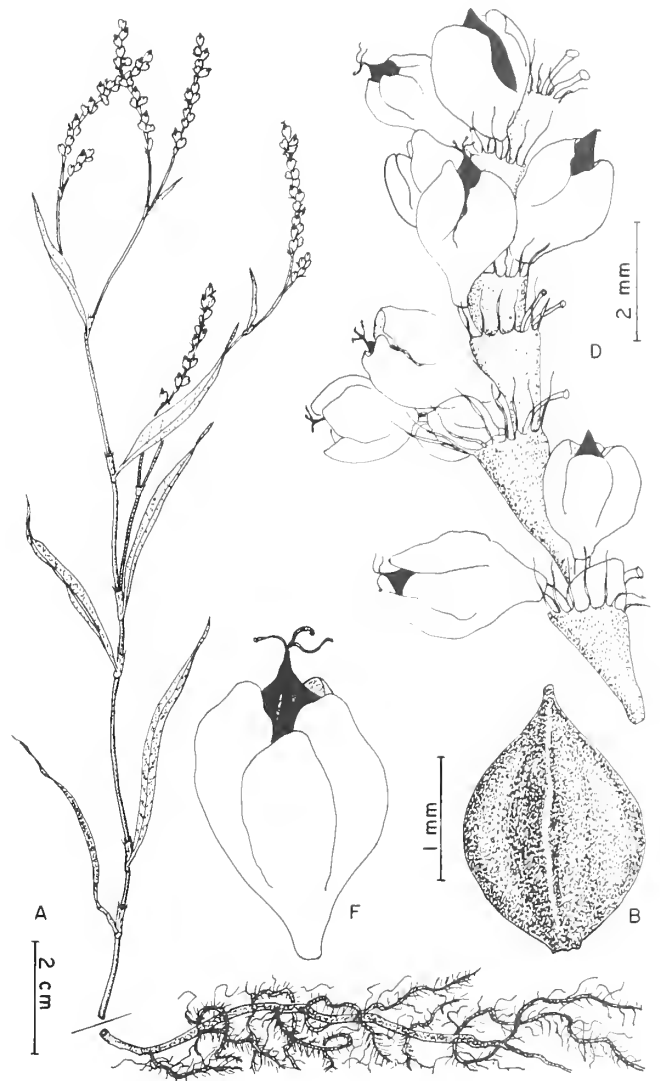
Origin: Southeastern Coastal Plain of the United States

Habitats: Wet, sandy to peaty soils near running water, swales

Habit: Erect, slender perennial

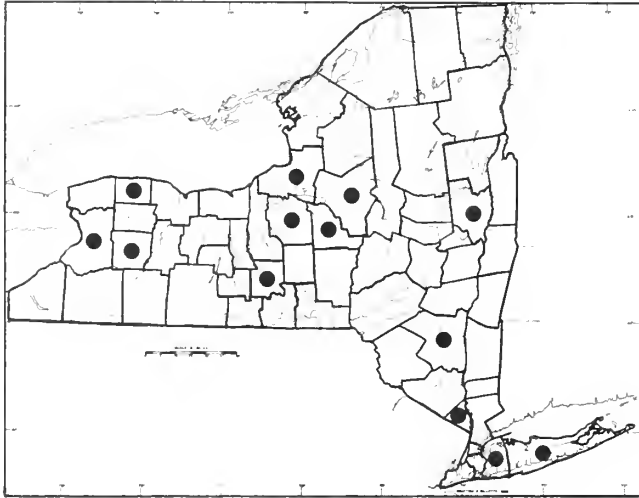
Flowering: July–October

General Distribution: Coastal Plain, Florida inland to Oklahoma, north to Long Island and the Massachusetts coast



Description: Plants with bisexual flowers; stigmas 3, capitate; styles 3, partially united; ovary 1, becoming a 3-angled achene; achene 1.5–2.5 mm. long, 1.3–2.3 mm. wide, often slightly exserted, brownish-black, lustrous; stamens 8, included in the perianth; perianth 5-lobed to below the middle, ovoid-spheroid in outline with the outer lobes incurved-cucullate at maturity, not enclosing the achene tip, flowers 1.5–2.5 mm. long, greenish at the base, tips creamy or rose to purple-tinged (not pink), sometimes with a few pale, scale-like glands unevenly spaced (not evenly punctate); bracts overlapping, sheathing with bristles 1–2 mm. long, on the margins; inflorescences usually continuous, dense, spike-like panicles, 3–6 mm. wide, 2–6 cm. long, not lax; peduncles glabrous to strigulose; leaves linear-lanceolate, 0.5–2.3 cm. wide, 5–15 cm. long, glandular beneath with blue-green to yellow, scale-like glands of the type occasionally found on the perianth, leaf undersurface more scabrous than the upper; petioles often scabrous, short; stipules tubular-sheathing, strigose with tough marginal bristles up to 8 mm. long; nodes swollen; internodes glabrous or strigulose; stems up to 1.3 m. high, usually branched, erect, wiry, from a perennial rhizome ($2n = 40$).

Note: Although leaves tend to be narrower than those of its near relative, *P. hydropiperoides* Michx., they may sometimes be broadly lanceolate. The characteristic plate-glands of *P. opelousanum* are usually found only on the vegetative parts, but are occasionally found on the perianth (var. *adenocalyx* Stanford). Though there may eventually be enough evidence to recognize this species as a variety of *P. hydropiperoides*, it is retained here on the basis of: perianth shape and achene exsertion (high percentages), plate-glands on the leaves, more wiry, erect habit and a habitat preference which defines its range. The species is rare in New York, occurring primarily on Long Island.



29. *Polygonum setaceum* Baldw. ex Ell.

Common Name: Smartweed

Type Description: Baldwin, in Elliott, Sketch Bot. S.C. and Ga. 1:455, 1817

Synonyms: *Persicaria setacea* (Baldw.) Small, *Polygonum hydropiperoides* Michx. var. *setaceum* (Baldw.) Gleason

Origin: Eastern United States

Habitats: Lake margins, swampy forests

Habit: Erect-ascending, robust perennial (may be mat-forming in lakes in New York)

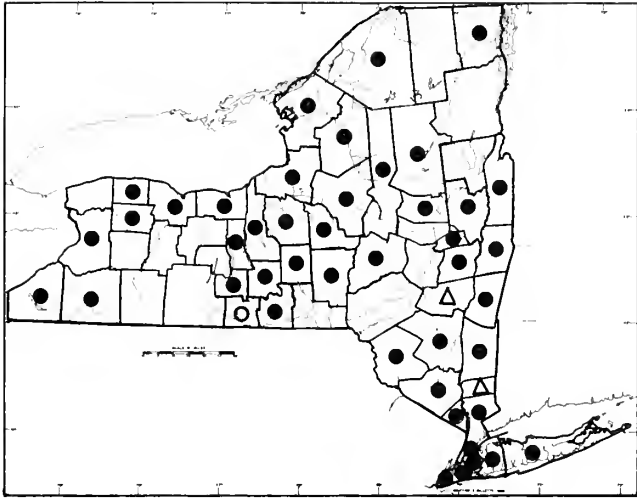
Flowering: July–October

Distribution: New York to Florida, west to Eastern Oklahoma



Description: Plants with bisexual flowers; **stigmas** 3, capitate; **styles** 3; **ovary** 1, becoming a 3-angled **achene**; achene 2–3 mm. long, brown to black, lustrous; **stamens** 8, included in the perianth; **perianth** 5-lobed, 3–3.5 mm. long, enclosing the achene, greenish at base with creamy to tan lobes, occasionally rose-tinged (not pink); **bracts** sheathing, ciliate margined; **inflorescences** usually uninterrupted, elongate, spike-like panicles, 3–6 mm. wide and 2–8 cm. long, single or usually several per apex; **peduncles** strigose, often 2-several from a given point on the axis (sometimes broom-like); **leaves** lanceolate, 7–20 cm. long, up to 4.8 cm. broad, usually strigose to hispid, but affected by water contact (rarely almost glabrous); **stipules** tubular-sheathing, slightly inflated at the base, 1–2 cm. long, with long, appressed hairs or minutely strigose (in ours), marginal bristles stiff, often twisted, up to 1.2 cm. long; **nodes** strongly swollen; **internodes** thick, the lower ones enlarged and somewhat woody in older plants; **stems** up to 1.5 m. tall from a tough, woody **rhizome** (occasionally stoloniferous in water), perennial ($2n = 20?$).

Intraspecific Variation: New York plants correspond with other northern populations which have been designated var. *interjectum* Fern. Leaves are uniformly short-haired, and the most characteristic property of the species is lacking: ours have no hispid fringes, formed by the long-spreading hairs of the stipules. Phenotypic variation has also been demonstrated with regard to pubescence and other leaf properties, when plants grow in contact with water (Mitchell, 1971, 1976). Glabrous var. *tonsum* Fern. appears to be merely a modification of this sort. Plants also vary in robustness and clustering of the inflorescences. In the northern part of the range *P. setaceum* is less easily distinguished from *P. hydropiperoides* Michx., whereas southern and midwestern populations have obvious hispid fringes, greenish-white flowers and grow in partially shaded swamp forests.



30. *Polygonum hydropiperoides* Michx.

Common Names: Mild Water Pepper, Water Smartweed

Type Description: Michaux, Fl. Bor. Amer. 1:239, 1803

Synonyms: *Polygonum mite* Pers. (not Schrank), *Periscaria hydropiperoides* (Michx.) Small

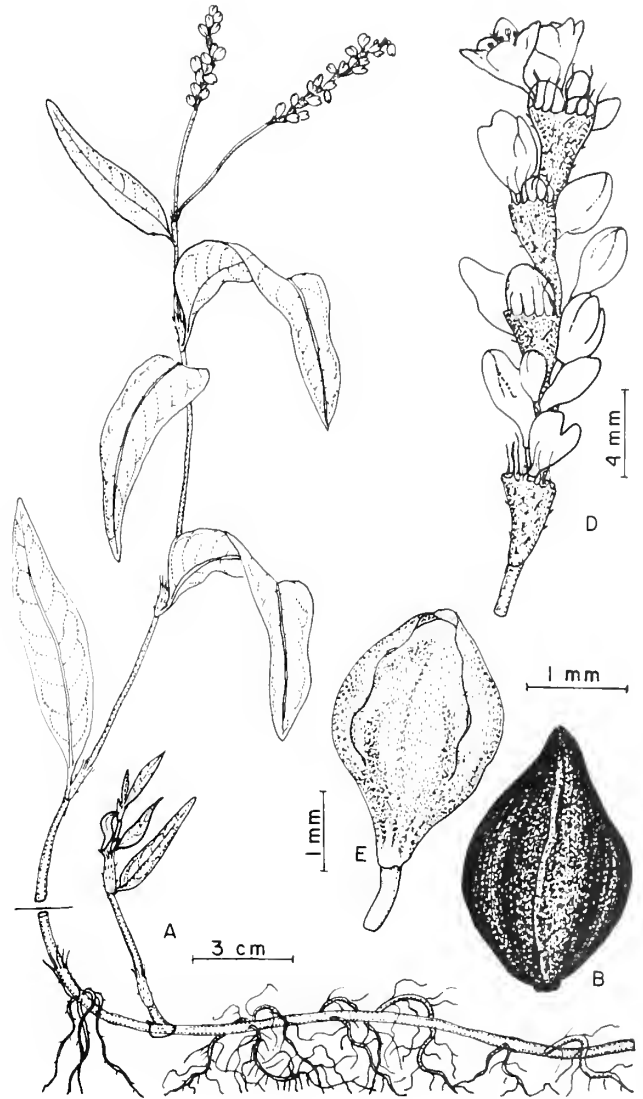
Origin: North America

Habitats: A great variety of semi-aquatic situations, usually in full sunlight

Habit: Ascending from decumbent stoloniferous bases, or erect when young, perennial

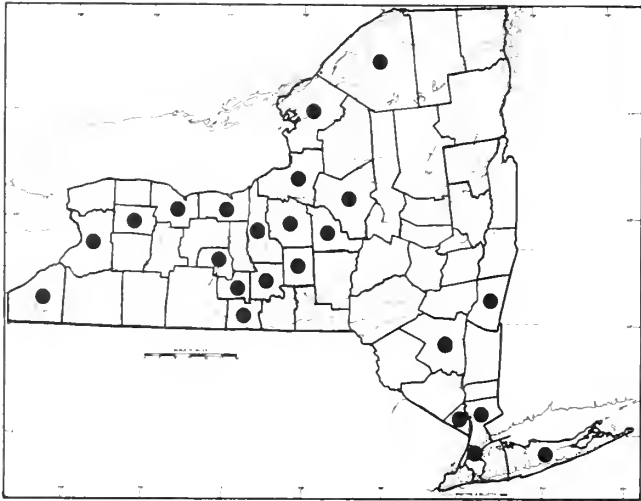
Flowering: July–October

General Distribution: Throughout most of North America



Description: Plants with male and bisexual flowers; **stigmas** 3, capitate; **styles** 3, partially united; **ovary** 1, becoming a 3-angled **achene**; achene sharply angled with flat to concave sides, 2–3 mm. long, nearly as wide, dark brown-black, lustrous, enclosed in the perianth; **stamens** usually 8, not exerted except in young, male flowers; **staminate flowers** 1.5–2.5 mm. long; **perfect flowers** with perianths becoming 2.5–4 mm. long in fruit, 5-lobed to just below the middle, roseate below to pink or creamy white at the lobe tips (rarely greenish, purplish or white), completely enclosing the achene; **bracts** pinkish-green, sheathing, with ciliate margins; **inflorescences** elongate, spike-like racemes, usually interrupted near the base, 2–5 mm. wide, 3–8 cm. long at maturity, erect; **peduncles** glabrous to scabrescent or strigose, 1–3 cm. long, slender; **leaves** broadly lanceolate to lance-linear, 0.4–3.5 cm. wide, 5–25 cm. long, with truncated obtuse to acute bases and acuminate tips, strigose, glabrous or nearly glabrous except for the margins; **petioles** 2–20 mm. long, variably pubescent; **stipules** tubular-cylindric, scarious, strigose or scabrous 1–3.5 cm. long, with tough, marginal bristles 3–8 mm. long; **nodes** swollen, adventitiously rooting; **internodes** elongate, glabrous to strigose; **stems** slender, stoloniferous-decumbent, but with strongly ascending tips, from a much-branched, perennial **rhizome** ($2n = 40$).

Intraspecific Variation: A number of varieties have been named (see Fernald, 1950) based on pubescence differences, leaf shape and inflorescence disposition. Very strigose populations of slender plants have been called f. *strigosum* (Small) Stanf.; these are often wrongly identified as *P. setaceum* Baldw. White, greenish and purplish-flowered forms have also been recognized. The group, including the closely related *P. setaceum* and *P. opelousanum*, forms a widespread, polymorphic complex in need of much further study.



31. *Polygonum robustius* (Small) Fern.

Common Name: Water Smartweed

Type Description: Fernald, Rhodora 23, 147, 1921

Synonyms: *Polygonum punctatum* var. *robustius* Small, *Polygonum punctatum* var. *majus* (Meisn.) Fassett, *Persicaria robustior* (Small) Bickn.

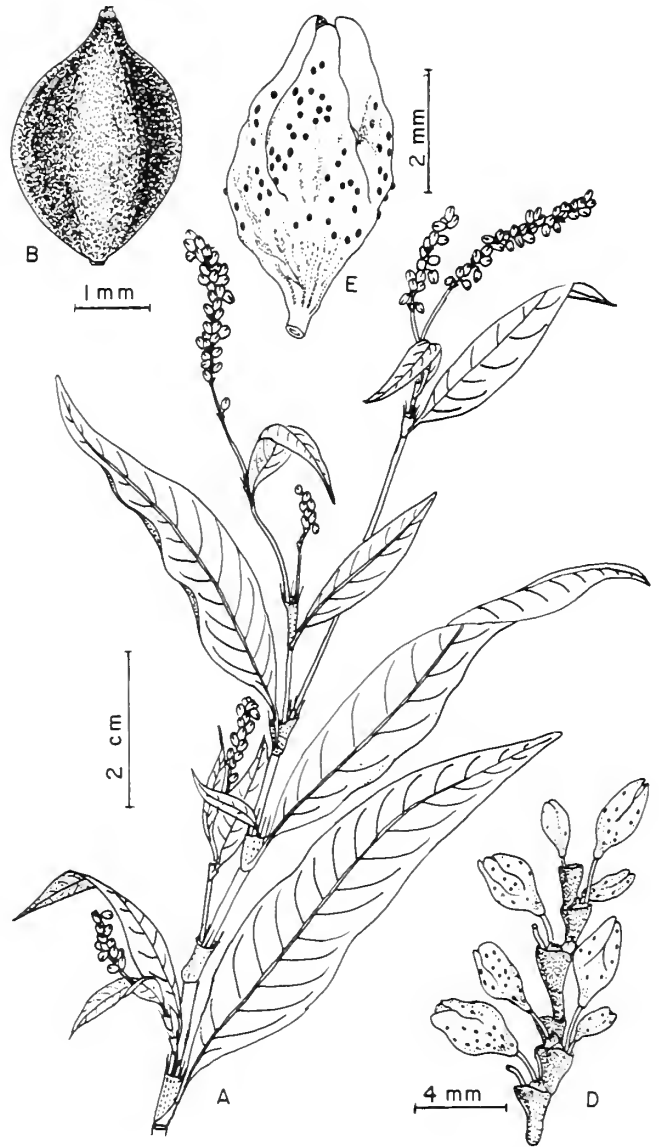
Origin: Probably North American Coastal Plain

Habitats: Wet soils and shallow water, swampy areas, stream and lake margins

Habit: Stout, erect perennial from a creeping rhizome

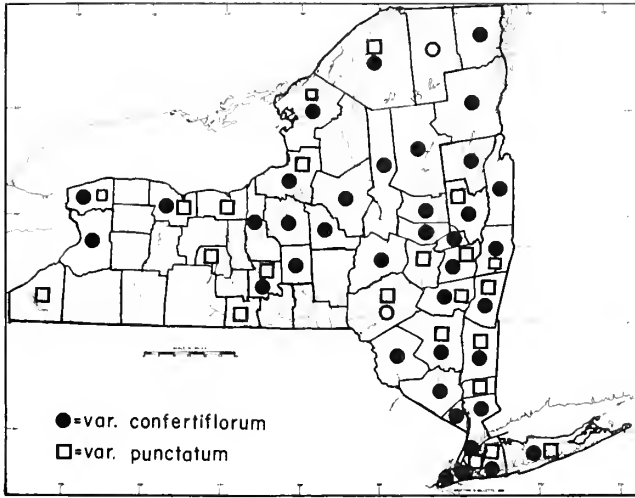
Flowering: July–October

General Distribution: Nova Scotia to Florida, down the eastern flyway to South America



Description: Plants with bisexual flowers; **stigmas** 3, capitate; **styles** 3, partially united; **ovary** 1, becoming a 3-angled achene (rarely lens-shaped); achene 2.7–3.6 (4) mm. long, oblong, tapered at both ends, with 3 concave sides, dark brown-black, lustrous; **stamens** 6–8, included; **perianth** 5-parted to well below the middle, greenish at the base with cream to white lobes, 3.2–4.2 mm. long, enclosing and surpassing the achene in length, strongly glandular-punctate (valvate chambers) with glands which are yellow-green and dry brownish; **pedicels** often exerted from the bracts; **bracts** sheathing, usually all overlapping (or only the lower 1–2 remote) eciliate (except lowermost) with truncate, entire margins; **inflorescences** uninterrupted (except occasionally lowest fascicles), spike-like, cylindric panicles, single or clustered 2–8 cm. long 4–8 mm. wide, erect; **leaves** 4–20 cm. long, 2–4.5 cm. wide, robust, lance-elliptic to lanceolate with tapered bases and acuminate tips, virtually glabrous except for scabrescent margins and some veins; **petioles** 2–7 mm. long, dilated at base; **stipules** tubular-cylindric, close-sheathing above but inflated somewhat below, strigose with stiff, marginal bristles 3–8 mm. long; **nodes** conspicuously swollen near the plant base, sprouting vegetatively in the fall; **internodes** stout, glabrous; **stems** ascending, up to 2 m. tall, from a branching woody rhizome.

Importance: Like its relative, *P. punctatum* Ell., this species is a good source of food for waterfowl which relish the achenes. Its tendency toward stronger vegetative reproduction makes it less efficient in this than the former species when total biomass is considered.



32. *Polygonum punctatum* Ell.

Common Name: Water Smartweed

Type Description: Elliott, Sketch Bot. S.C. and Ga., 1:455, 1817

Synonyms: *Polygonum acre* H.B.K., *Persicaria punctata* (Ell.) Small

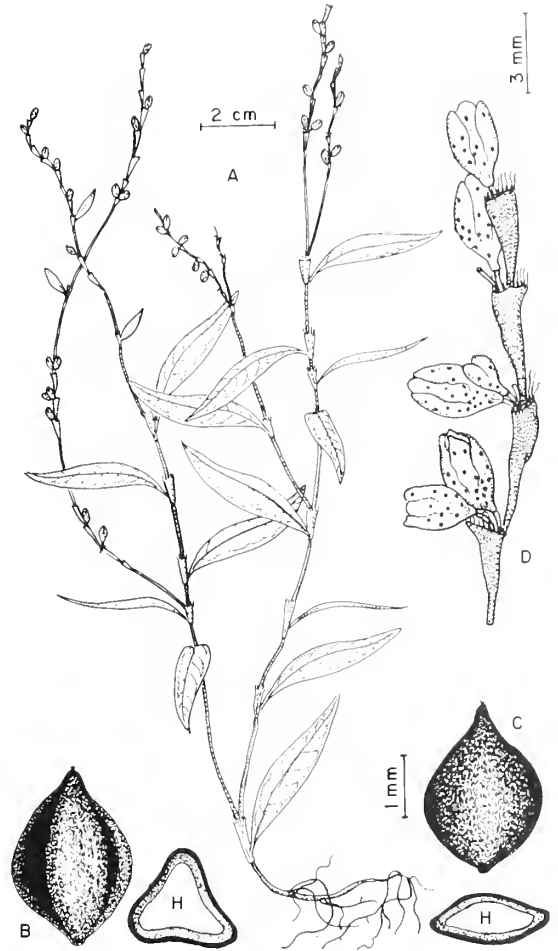
Origin: Probably North America

Habitats: Moist ground and shallow waters

Habit: Ascending-erect from prostrate stolons and rhizomes or a suberect annual

Flowering: June–October (New York)

General Distribution: North, Central and South America



Description: Plants with bisexual flowers; stigmas 2–3, capitate; styles 2–3, partially united; ovary 1, becoming a lens-shaped or 3-angled achene; achene ovoid-elongate, 2.5–3 mm. long, brown to black, lustrous; stamens 6–8, included; perianth 5-parted to below the middle, greenish at the base with creamy lobes, 3–3.5 mm. long, enclosing the fruit at maturity, covered with glandular dots (valvate chambers) which are yellow-green and dry brown; bracts sheathing, often remote, not overlapping in continuous series, ciliate-margined; inflorescences interrupted, spike-like panicles (one variety with long, many flowered axes and numerous shorter inflorescences scattered) terminal ones 1–5 mm. wide up to 20 cm. long but most often around 7 cm., interrupted occasionally by tiny leaves; leaves lanceolate-ovate to subrhombic, cuneate at the bases (in ours) with acute tips 4–10 (15) cm. long, 6–24 mm. wide, drastically reduced in and near terminal inflorescences, glandular-punctate, scabrescent to glabrous except the margins; petioles short, abruptly dilated; stipules tubular-cylindric, 9–18 mm. long, strigulose or glabrous, but with bristles at the margin, rupturing with swelling of the nodes; internodes slender, elongate, up to 10 cm.; stems ascending-erect, up to 1.2 m. tall, from horizontal stolon and rhizomes or an annual rootstock.

Infraspecific Variation: A large number of varieties of this species have been named in North and South America. Of the three which have been recorded for New York State, the least reliable is var. *parcum* Fassett, which appears to be a depauperate form. Though our two major varieties have intermediates, most plant populations may be distinguished as in the following key:

KEY TO VARIETIES

1. Plants perennial, from a creeping rhizome; inflorescences relatively uniform in size and terminal to leafy branches; achenes predominantly 3-angled*P. punctatum* Ell. var. *punctatum*
1. Plants annual from a small taproot (or slightly creeping); some inflorescences quite elongate, branch-like, from lower nodes; achenes predominantly lens-shaped.....*P. punctatum* Ell. var. *confertiflorum* (Meisn.) Fassett

Importance: Our most common, native Smartweed; extremely valuable as a food for birds, especially waterfowl.

Waifs: *Polygonum polycnemioides* Jaub. and Spach, was collected once around carpet mills in Yonkers in 1894 (E. P. Bicknell, s.n., NY); it has not been collected since that time, and probably did not persist. Another specimen superficially similar, but lacking the technical characters, was collected near Barton (Tioga County) in 1900 by F. E. Fenno. This specimen was cited by House (1924) and referred to *P. aviculare* var. *crassifolium* Lange. It actually bears little resemblance to *P. aviculare*, but is more similar to a species-complex in the Russian flora. Its identity has yet to be determined. Two additional species are found near gardens, but are doubtfully naturalized: *P. aubertii* L. Henry (Monroe, Ulster Counties; *P. polystachium* Meisn. (Ulster County).

4. FAGOPYRUM

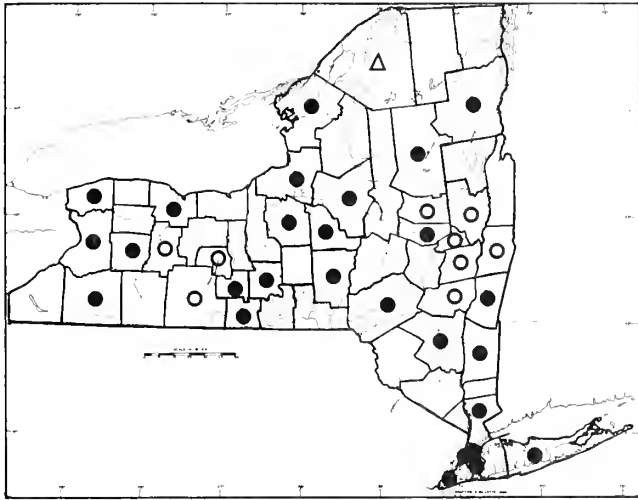
Common Name: Buckwheat

A Eurasian genus closely allied to *Polygonum* and of some economic importance. Two species are found in New York State as escapes from cultivation. They are usually not long persistent, but may appear naturalized for several years.

Description: Flowers bisexual; stigmas 3, capitate; styles 3, slender, free; ovary 3-lobed, unilocular with a single large orthotropous ovule; **placentation** basal, almost central; **fruit** a large, bluntly or sharply angled achene, pale brown to ebony, rough to shiny, exerted strongly from the unenlarged perianth; **seed** conforming to the fruit walls; **endosperm** copious, mealy; **embryo** large, dividing the endosperm, with large, much folded **cotyledons**; **stamens** 8; **perianth** petaloid, pale, equally 5-parted, not accrescent, persistent but wilting and drying; **pedicels** slender; **bracts** hemicylindric; **inflorescences** compound panicles borne laterally or simulating terminal corymbs; **leaves** hastate to sagittate, with substantial **petioles** below, much reduced upward; **stipules** hemicylindric, bristleless; **nodes** and **internodes** slender; **stems** ascending-erect, from an annual **taproot**.

KEY TO SPECIES OF FAGOPYRUM

1. Flowers creamy to white, 3–4 mm. long; achenes 5–7 mm. long; inflorescences corymb-like, clustered near the apex1. *Fagopyrum sagittatum* (p. 59)
1. Flowers greenish, averaging 2–3 mm. long; achenes 5–5.5 mm. long; inflorescences raceme-like, more evenly distributed2. *Fagopyrum tataricum* (p. 60)



1. *Fagopyrum sagittatum* Gilib.

Common Name: Buckwheat

Type Description: Gilibert, Exerc. Phyt. II, p. 435, 1792

Synonyms: *F. esculentum* Moench., *Polygonum fagopyrum* L.

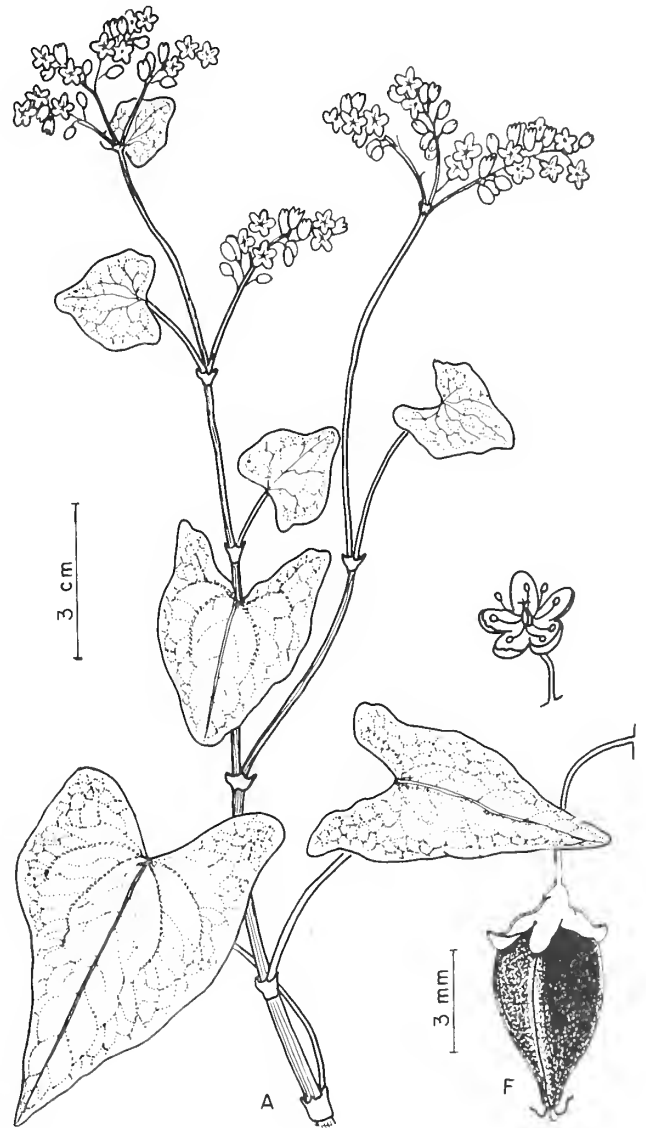
Origin: Asian, cultivated in Europe and North America

Habitats: Disturbed ground, waste places, field margins

Habit: Erect to spreading annual

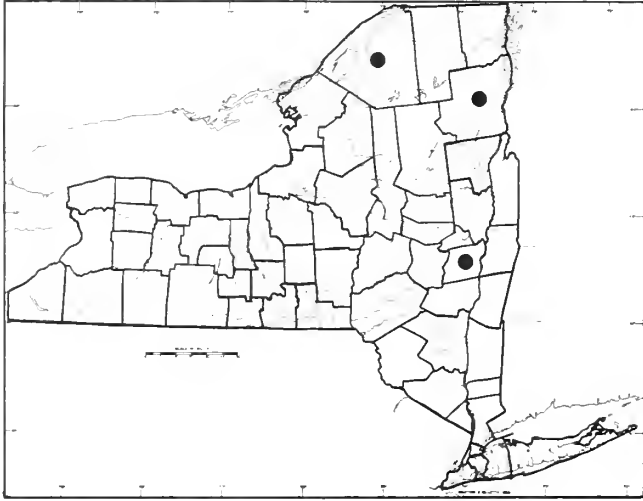
Flowering: June–August

General Distribution: Circumboreal escape, near sites of cultivation in cool climates



Description: Plants with bisexual flowers; stigmas 3, capitate; styles 3, free; ovary 3-angled, becoming a trigonous achene; achene 5–7 mm. long, shiny, dark brown, with rounded angles, much exerted when ripe; stamens 8; anther sacs reddish, about equal the perianth in length; perianth petaloid, 3–4 mm. long, 5-lobed to below the middle, creamy to white, streaked with tan, greenish only at very base, with a minute puberulence; bracts hemicylindric, sheathing, acute to apiculate, greenish with scarious ones within; inflorescences corymb-like panicles, concentrated toward the plant apex; peduncles with patches of puberulence; leaves triangular-hastate; long petioles near the base of the plant becoming much reduced with the leaves toward the apex; leaf margins and veins with minute hairs; stipules scarious, obliquely truncated, often split along one side, bristleless; nodes scarcely enlarged; stem tough, erect from an annual taproot ($2n = 16$).

Importance: Early cultivation in Nepal, China, Siberia, spread to Europe in the 16th century; ground up achenes make a flour used much like a cereal to make griddle cakes or a bread; United States production was once much higher; in 1880, fourteen and one half million bushels were produced, one third of which came from New York State; it is used as a cattle food, cover crop, mulching and forage for grazing animals; it may be brewed into a beer; it is cited as a honey plant and the leaves are a source of a brown (yellow) dye; unrefined, it is well known as a photosensitizer in cattle and humans (rare), and it has been implicated in human allergenic response; in folk medicine it was used to treat erysipelas and purported to return milk to nursing mothers.



2. *Fagopyrum tataricum* (L.) Gaertn.

Common Name: India Wheat

Type Description: Gaertner, Fruct. II, p. 182, 1791

Synonym: *Polygonum tataricum* L.

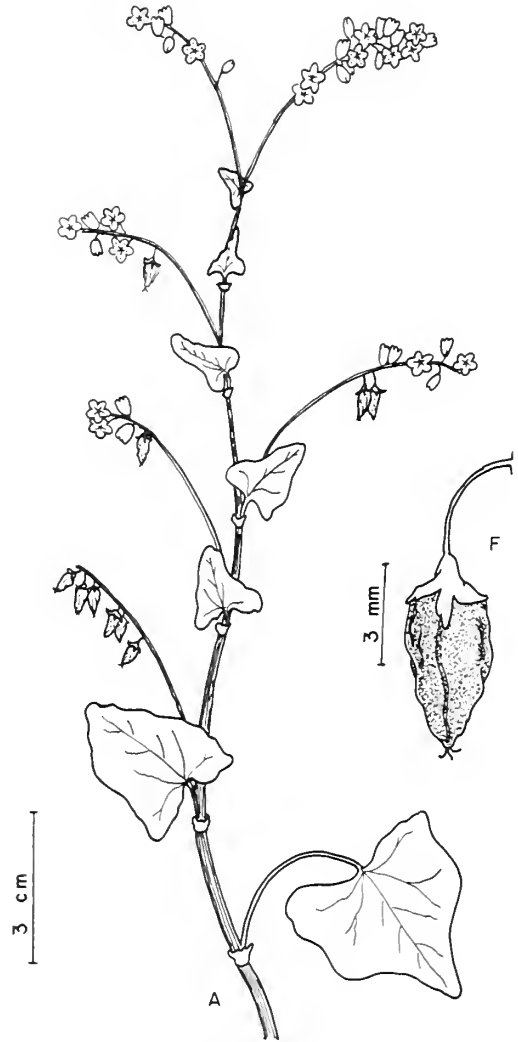
Origin: Asia, cultivated in Europe

Habitats: Waste places, disturbed ground, field margins (cultivated)

Habit: Erect annual

Flowering: June–September

General Distribution: Eurasia, North America as an escape



Description: Plants with bisexual flowers; stigmas 3, capitate; styles 3, free; ovary 1, becoming a 3-angled achene; achene 5–5.5 mm. long, dull, rough on the surfaces, sharply or irregularly margined, brown, exserted when ripe; stamens 8, about equal to the perianth; perianth 5-lobed to below the middle, 2–3 mm. long, greenish with slightly paler or rose-tinged lobes; bracts sheathing, scarious; inflorescences raceme-like panicles 2–5 cm. long, subevenly scattered throughout the plant; peduncles up to 6 cm. long, becoming shorter upward with the leaves, glabrous; leaves broadly hastate, puberulent on some veins and margins, (leaves) reduced upward; petioles up to 7 cm., reduced upward, puberulent to densely glandular; stipules tubular to lacerate, puberulent to glandular, without marginal bristles; nodes scarcely swollen; stems tough, erect, from an annual taproot.

Importance: Far less widely cultivated than Buckwheat itself, but with many of the same attributes.

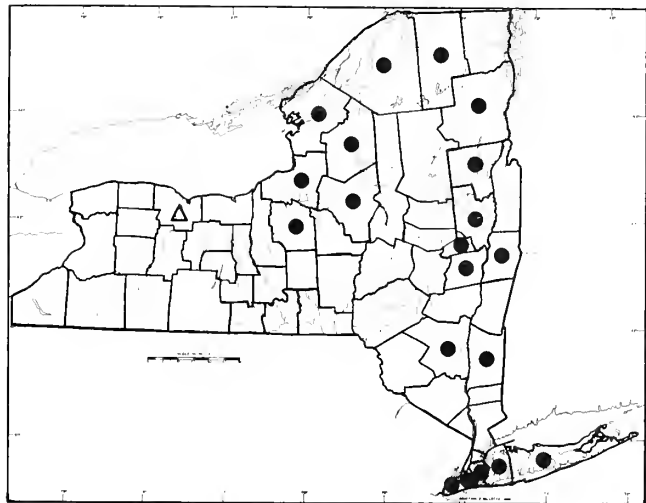
5. POLYGONELLA

Common Name: Jointweed

A genus of about nine species, native to the Eastern United States. Mostly indigenous to the Southern Coastal Plain, but with one species ranging northward, and another an endemic outlier in Texas. Represented in New York State by a single species.

Description: Flowers bisexual or functionally unisexual; stigmas 3, capitate; styles 3, separate; ovary unilocular, 3-angled, with a single orthotropous ovule in one of its angles; placentation basal; fruit an achene, 3-angled (rarely 2 or 4), acute to acuminate at apex, acuminate to truncate at base, gray, yellow or dark reddish-brown, glossy or minutely pebbled; seed conforming in shape to the achene in maturity; embryo straight or slightly curved; endosperm mealy; stamens 8, in series of 3 inner and 5 outer: filaments alike or the inner ones dilated, anther sacs

white through red to dark purple, opening by 2 longitudinal slits; **perianth** petaloid, 3-lobed with 2 outer and 3 inner (or one of these transitional); **outer lobes** white, pink or red, glabrous, appressed, spreading or reflexed, margins entire (in ours) or erose; **inner lobes** similarly colored, glabrous, oblong with obtuse apices, entire (or erose to fimbriate), distinctly to slightly accrescent; **pedicels** jointed to unbranched peduncles, deflexed in fruit (in ours); **inflorescences** racemose (acropetal) with flowers borne singly from the axils of imbricated, tubular bracts (ocreolae), slender, often numerous; **leaves** alternate, glabrous (rarely scabrous) usually caducous (in ours), filiform (to obovate) the apex linearly acute (to obtuse), bases articulated, the joint occurring near the stipule summit; **stipules** tubular-cylindric, glabrous; **branches** adnate, diverging laterally well above the nodes; **internodes** fluted and striated, greenish to pink (with reddish bark in some); **stem** erect or prostrate from annual or perennial **tap-roots**.



1. *Polygonella articulata* (L.) Meisn.

Common Names: Jointweed, "Heather"

Type Description: Meisner, Gen. Comm. 2:228, 1836-43

Synonyms: *Delopyrum articulatum* (L.) Small, *Psamogonum articulatum* (L.) Niewl.

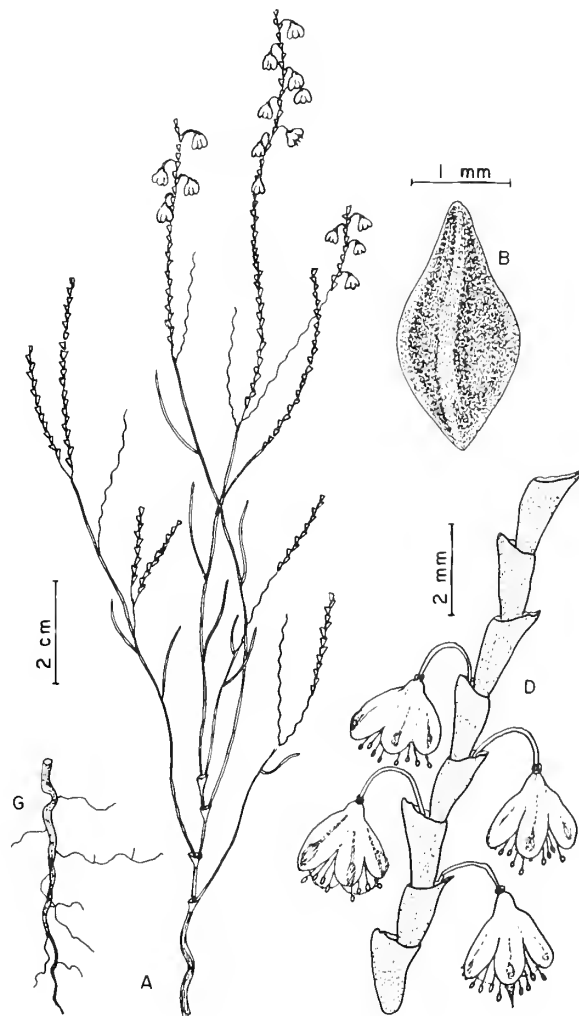
Origin: Native, Eastern United States

Habitats: Poor, often sandy soils; open, usually sunny sites

Habit: Erect, wiry, heath-like annuals

Flowering: August–November

General Distribution: Minnesota to Maine, south to North Carolina on the coast



Description: Plants with bisexual flowers or polygamous; **stigmas** 3, **styles** 3, free; **ovary** 1, becoming a 3-angled **achene**; achene, shiny, red-brown, slightly exserted at maturity, 2–2.8 mm. long; **stamens** 3, equaling the perianth or slightly exserted, inner filaments dilate at base; **perianth** with 5 subequal lobes, 1.4–2.5 mm. long, white to pink or rose (rarely purplish), the outer 3 with small green keels; **pedicels** up to 2.8 mm. long, recurved in fruit; **inflorescences** of slender, branched racemes 2–3.5 cm. long, with flowers borne singly from the axils of the sheathing bracts; **leaves** linear, early deciduous, glaucous, jointed at the base, 0.5–2.5 cm. long, 0.5–1.5 mm. wide; **stipules** tubular-cylindric, glabrous, acute, bristleless; **stems** wiry, green or red-tinged, slightly ribbed, glaucous, 8–50 cm. tall, erect (rarely prostrate) from a wiry, often coiled **taproot** ($2n = 32$).

Infraspecific Variation: Plants with dark, purple-red flowers have been referred to forma *atrorubens* Fern. Certain populations on Long Island occur in blowout areas of dunes and lie prostrate.

APPENDIX I

FUNGI ASSOCIATED WITH THE POLYGONACEAE OF NEW YORK STATE

To be included on this list, a fungus must (1) occur on a polygonaceous host whose distribution includes New York State; or (2) the fungus must have been collected in New York (not necessarily on a polygonaceous host) and be recorded as occurring on a genus of polygonaceous host which occurs in New York State. A single asterisk (*) indicates that this second set of conditions has been fulfilled.

Abbreviations of states indicate a literature citation for each state. Double asterisks (**) indicate that a herbarium specimen with New York State polygonaceous host information has been seen.

MYXOMYCETES (SLIME MOLDS)

Physarum polycephalum Schw. * on *Polygonum aviculare*

CHYTRIDIALES

Synchytrium anomalum Schroet. on leaves of *Rumex acetosa* (Iowa)

Urophlyctis major Schroet. on *Rumex verticillatus* (N. Dak., Wisc.) *Rumex orbiculatus***

SAPROLEGNIALES

Plectospora plagiocaula Drechsler on roots of *Rumex acetosella* (Md.)

PERONOSPORALES

Peronospora americana Gäum. on *Polygonum ramosissimum* (Ill., Nebr.)

Peronospora polygoni A. Fisch. on *Polygonum aviculare* (Iowa), *P. convolvulus*,

P. ramosissimum, *P. scandens* (N.Y.), *P. scandens* var. *dumetorum* (N.Y.) *Rheum rhaponticum* (Cal.)

Phytophthora cactorum (Lebert and Cohn) Schroet. on *Rheum rhaponticum* (Pa., Mo., Okla., Cal.)

Phytophthora parasitica Dastur on *Fagopyrum sagittatum*, *Rheum rhaponticum***

Phytophthora terrestris Sherb. on *Rheum rhaponticum*

Pythium anandrum Drechsler on *Rheum rhaponticum* (Cal., Md.)

Pythium helicandrum Drechsler on *Rumex acetosella* (Md.)

Pythium irregulare Buis. on *Rheum rhaponticum* (Cal.)

Pythium oligandrum Drechsler on *Rheum rhaponticum* (Cal.)

Pythium splendens Braun on *Rheum rhaponticum* (Cal.)

ERYSIPHALES (POWDERY MILDEWS)

Erysiphe cichoracearum DC. ex Mér. on *Rumex altissimus*

Erysiphe polygoni DC. ex Mér. on *Fagopyrum sagittatum*, *Polygonum aviculare***,

P. buxiforme, *P. erectum***, *P. convolvulus* (Ind.), *P. persicaria* (N.Y.),

P. ramosissimum, *P. ramosissimum* forma *exertum*, *P. scandens*

Phyllactinia guttata (Fr.) Lév. (= *P. corylea* Pers. ex Karst) on *Polygonum virginianum* (Mich.)

DOTHIDEALES

Didymella exigua (Niessl) Sacc. on *Rumex acetosa*

Didymella lophospora (Ellis) Sacc. and Spreng. * on *Rumex acetosella*, *Rumex* sp.

Mycosphaerella polygonorum (Crié) Dearness and House (see *Depazea*, Sphaeropsidales)

Mycosphaerella tassiana (DeNot.) Johanson on *Rumex acetosella* [(perfect state of *Cladosporium herbarum* (Pers.) Link ex Fr.)]

SPHAERIALES

- Diaporthe arctii* (Lasch) Nits. * on dead stems of *Polygonum* sp., on dead stems of *Rumex crispus* (Ga.)
Diaporthe dakotensis Wehmeyer stems of *Polygonum amphibium* var. *emersum* (S. Dak.)
Gnomoniella curvicolla (Peck) Cooke on *Polygonella articulata***
Gnomoniella eccentrica (Cooke and Peck) Sacc. on *Polygonum amphibium***
Metasphaeria polygoni-sagittati (Schw.) Ellis and Everh. on *Polygonum sagittatum*, *Polygonum scandens*

HELOTIALES

- Helotium rhizicola* Seaver on *Polygonum virginianum* (N.Y.)
Hymenoscyphus scutulus (Pers. ex Fr.) Phill. on *Polygonum amphibium* var. *emersum*
Hymenoscyphus scutulus (Pers. ex Fr.) Phill. var. *fucata* Phill. on *Polygonum robustius*
Mollisia discolor (Mont.) Phill.* on *Polygonum pensylvanicum*
Mollisia polygoni (Lasch) Gill. on *Polygonum lapathifolium*** , *P. persicaria* (N.J.)

PLEOSPORALES

- Leptosphaeria fusispora* Niessl on *Polygonum cuspidatum* (N.Y.)
Ophiobolus acuminatus (Sow.) ex Fr. on * *Polygonum* sp.
Physalospora obtusa (Schw.) Cooke on stems of *Polygonum* sp. (Ala., N.J.), *Rumex crispus* (Ga.), *R. obtusifolius* (Ga.)
Physalospora polygoni Ellis and Everh. on *Polygonum pensylvanicum* (Ala.)
Pleospora compressa Harkn. on *Polygonum amphibium* var. *emersum* (Cal.)
Venturia canadensis Barr on *Rumex acetosella* (Can.)
Venturia rumicis (Desm.) Winter on *Rumex crispus* (Wash.), *R. obtusifolius* (Ala., Wash.), *R. triangulivalvis*

UREDINALES (RUSTS)

- Aecidium polygoni* Chev. on *Polygonum aviculare*
Aecidium sommerfeltii Johanson on *Polygonum scandens*
Puccinia acetosae (Schum.) Koern. on *Rumex acetosa*** , *R. acetosella*** , *R. hastatulus* (Fla., Mass., S.C.), *R. persicarioides*; II, III on *Rumex*; O, I unknown
Puccinia aristidae Tracy on *Polygonum aviculare* (Colo., Del., N. Dak., S. Dak., Nebr.), *P. erectum* (Colo.), *P. ramosissimum* (Colo.); I on *Polygonum*; II, III on various grasses
Puccinia ornata Arth. and Holw. on *Rumex orbiculatus***
Puccinia parca Arth. on *Polygonum scandens* (N.Y.)
Puccinia phragmitis (Schum.) Koern.; O, I, on *Rheum rhaponticum* (Cal., Minn., Nebr.), *Rumex crispus* (Nebr.); Experimentally on *Polygonum convolvulus*, *P. lapathifolium*, *P. pensylvanicum*, *Rumex acetosa*, *R. altissimus*, *R. conglomeratus*, *R. longifolius*, *R. obtusifolius*, *R. orbiculatus*, *R. patientia*, *R. pulcher*, *R. triangulivalvis*; II, III on *Phragmites australis*
Puccinia polygoni-amphibii Pers. var. *convoluti* (Alb. and Schw.) Arth. on *Polygonella articulata* (Fla.), *Polygonum convolvulus*** , *P. scandens*** , *P. scandens* var. *cristatum* (Miss., N.C., Pa., Tex., Va.), *P. scandens* var. *dumetorum* (W. Va.); II, III on *Polygonella* and *Polygonum*; O, I not known in United States, on *Geranium* sp. in Europe
Puccinia polygoni-amphibii Pers. var. *persicariae* (Strauss) Arth. on *Polygonum amphibium*** , *P. careyi*, *P. hydro-piper* (S.C.), *P. hydropiperoides*** , *P. lapathifolium*** , *P. opelousanum*** , *P. pensylvanicum*** , *P. persicaria* (Del., Pa., Ga., La., Ore.), *P. punctatum*** , *P. setaceum* (Ala., La., Mo.); II, III on *Polygonum*; I on *Geranium* sp.
Puccinia polygoni-amphibii Pers. var. *tovariae* Arth. on *Polygonum virginianum*** , *P. pensylvanicum* (La.); II, III on *Polygonum*; O, I unknown
Puccinia punctiformis Diet. and Holw. (= *Puccinia lapathicola* Hylander, Jovst. and Nannfeldt) on *Rumex altissimus*, *R. crispus*, *R. triangulivalvis* (Kan., Tex., Wisc.)
Uromyces polygoni (Pers.) Arth. [(= *Uromyces polygoni-avicularis* (Pers.) Karst.)] on *Polygonum aviculare*** , *P. buxiforme* (Cal., Colo.), *P. erectum*** , *P. glaucum* (La., Mass.), *P. neglectum*, *P. ramosissimum* (Ill., Iowa, Kan., Minn., Mont., Nebr.), *P. setaceum*

USTILAGINALES (SMUTS)

- Melanopsichium austro-americanum* (Speg.) Beck on *Polygonum aviculare* (Cal.), *P. lapathifolium* (?)
Melanopsichium pennsylvanicum Hirsch. on *Polygonum lapathifolium*** , *P. pennsylvanicum*
Melanopsichium pennsylvanicum Hirsch. var. *besseyanum* Zundel on *Polygonum hydropiper* (N.Y.)
Melanopsichium pennsylvanicum Hirsch. var. *caulicolum* Zundel on *Polygonum aviculare* (N.Y.), *P. lapathifolium* (N.Y.)
Sphaceotheca hydropiperis (Schum.) deBary on *Polygonum hydropiper* (N.Y.), *P. hydropiperoides*** , *P. persicaria* (N.Y.), *P. sagittatum***
Ustilago anomala J. Kunze on *Polygonum cilinode* (N.Y.), *P. convolvulus*** , *P. hydropiper*** , *P. pennsylvanicum* , *P. punctatum*** , *P. scandens* , *P. scandens* var. *dumetorum*
Ustilago anomala J. Kunze var. *tovarae* Savile on *Polygonum virginianum* (Que.)
Ustilago parlatorei Fisch. von Waldh. *Rumex acetosella* (S.C.), *R. altissimus* (Mo., Nebr.), *R. hastatulus* (Ala., Fla.), *R. orbiculatus* (Mo., Nebr.), *R. triangulivalvis* (Mo., Nebr.)
Ustilago rumicis (Berk.) Clinton (= *Ustilago parlatorei* Fisch. von Waldh.)
Ustilago tenuispora Cif. on *Polygonum punctatum*** (Fla.)
Ustilago utriculosa (Nees) Ung. on *Polygonum amphibium*** , *P. aviculare* (Cal.), *P. careyi*** , *P. erectum* (Miss.), *P. hydropiper* , *P. hydropiperoides*** , *P. lapathifolium*** , *P. pennsylvanicum*** , *P. persicaria*** , *P. sagittatum* , *P. scandens***

APHYLLOPHORALES

- Pellicularia filamentosa* (Pat.) Rogers* on *Polygonum* sp. (Fla.)
Typhula intermedia Appel and Laubert on Buckwheat straw (N.Y.)
Typhula phacorrhiza Reichard ex Fr. on Buckwheat straw (N.Y.)
Typhula variabilis Riess on Buckwheat straw (N.Y.)

AGARICALES (MUSHROOMS)

- Armillaria mellea* Vahl ex Fr. Root rot on *Rheum rhaponticum*
Galerina sulcatipes (Berk.) Singer on *Fagopyrum sagittatum*

MONILIALES

- Alternaria alternata* (Fr.) Keiss. on *Fagopyrum sagittatum* (Iowa, Minn., Vt.)
Alternaria sp. *Rheum rhaponticum* (N.J., Pa.)
Botrytis cinerea Pers. ex Pers.* Gray Mold Rot on *Rheum rhaponticum*, occasional in the field, forcing culture and markets (Mich., Mo., Va., Wash.)
Botrytis fascicularis (Corda) Sacc. on *Polygonum* sp.**
Botrytis hypophylla Ellis and Kellerm. on *Polygonum hydropiper*
Cercospora acetosellae Ellis on *Rumex acetosa*** (Tex.), *Rumex acetosella* (La., N.C., N.J., Tex.)
Cercospora acetosellae Ellis var. *maculosa* Peck on *Rumex crispus***
Cercospora avicularis Wint. on *Polygonum aviculare*** , *P. erectum*
Cercospora polygonacea Ellis and Everh. on *Polygonum aviculare* (N.Y.), *P. convolvulus* , *P. lapathifolium* , (Mont.), *P. ramosissimum* (Kan.), *P. sagittatum* (N.Y.), *P. scandens* , *P. scandens* var. *dumetorum*
Cercospora rhapontici Tehon and Daniels on *Rheum rhaponticum* (Ill., Del.?, Md.?, Nebr.?)
Cercospora rumicis Ellis and Langl. on *Rumex crispus* (Iowa), *R. obtusifolius* (La., Tex.)
Cladosporium herbarum (Pers.) Link ex Fr.* on *Rheum rhaponticum* (Cal., Wash.)
Coniosporium harknessioides (Ellis and Holw.) Sacc. on *Rumex acetosa* , *R. acetosella*
Didymaria effusa (Berk. and Curt.) Solheim (including *Cercospora hydropiperis* Thuem. and *Cercospora polygonorum* Cooke) on *Polygonum amphibium* var. *emersum* , *P. hydropiper*** , *P. hydropiperoides*** , *P. lapathifolium* , *P. pennsylvanicum* , *P. persicaria* , *P. punctatum*** , *P. sagittatum*
Fusarium sp. on *Rheum rhaponticum* (N.C., Okla., Wash.)
Ovularia avicularis Peck on *Polygonum aviculare*
Ovularia histortae (Fuckel) Sacc. on *Polygonum erectum*

Ovularia monosporia (West) Pound and Clements [= *O. obliqua* (Cooke) Oud.] on *Rumex altissimus* (Tex.), *R. crispus*** , *R. obtusifolius*** , *R. orbiculatus* , *R. verticillatus*
Ovularia rigidula Delacr. on *Polygonum aviculare* (Nebr., Wisc.), *P. erectum* (Wisc.)
Periconia byssoides Pers. ex Merat* on *Rumex* sp.
Phymatotrichum omnivorum (Shear) Dug. on *Polygonum aviculare* (Tex.), *P. lapathifolium* (Tex.), *Polygonum* sp. (Tex.), *Rheum rhaponticum* (Ariz., Tex.), *Rumex crispus* (Tex.)
Ramularia anomala Peck on *Fagopyrum sagittatum* (Conn.), *Polygonum convolvulus* (Ind., Nebr., Wisc.), *P. scandens* (Ind., Nebr., Wisc.)
Ramularia cilinodis J. J. Davis on *Polygonum cilinode*** (Pa., Wisc.)
Ramularia circumfusa Ellis and Everh. on *Rumex obtusifolius* (Tex.)
Ramularia obovata Fuckel on *Rumex crispus*** , *R. verticillatus***
Ramularia occidentalis Ellis and Kellerm. on *Rumex altissimus* , *R. orbiculatus*** , *R. crispus*** (Ill., Iowa, La., Kans., Miss., Nebr., N.H., Wisc.)
Ramularia pratensis Sacc. on *Rumex orbiculatus* (Del., Md., Wisc.), *R. persicarioides* (Wisc.), *R. verticillatus* (Del., Md., Wisc.)
Ramularia rhei All. on *Rheum rhaponticum* (Cal.)
Ramularia rufomaculans Peck (= *Septocylindrium rufomaculans* (Peck) Pound and Clements), on *Fagopyrum sagittatum* , *Polygonum amphibium*** , *P. aviculare* (Iowa), *P. cilinode*** , *P. hydropiper* (N.Y.), *P. lapathifolium*** , *P. persicaria* (N.Y.), *P. scandens* , *P. scandens* var. *dumetorum* (Iowa), *Polygonum* sp. (N.Y.)
Rhizoctonia solani Kuehn on *Fagopyrum sagittatum* , *Polygonum convolvulus* (Wash.), *Rheum rhaponticum* (N.Y.), *Rumex acetosa* (Tex.), *R. acetosella* (Tex.)
Spegazzinia rubra Dearness and House on *Polygonum scandens***

SPHAEROPSIDALES

Ascochyta biguttulata Daniels on *Polygonum convolvulus* (Ill.), *P. persicaria* (Okla.)
Ascochyta bresadolae Sacc. and Syd. on *Fagopyrum sagittatum* (Conn., Pa., Wisc.)
Ascochyta fagopyri Bres. on *Fagopyrum sagittatum* (N.Y.)
Ascochyta rhei Ellis and Everh. on *Rheum rhaponticum***
Darluca filum (Biv.) Cast. on *Polygonum amphibium*** on the sori of the rust, *Puccinia polygoni-amphibii*
Depazea polygonorum Crié [= *Mycosphaerella polygonorum* (Crié) Dearness and House] on *Polygonum amphibium* var. *emersum*
Diplodia polygonicula Peck on *Polygonum lapathifolium* (Kans.)
Macrophoma pulchrispora (Peck and G. W. Clinton) Sacc. on *Polygonum pensylvanicum* (N.Y.)
Macrophoma straminella (Bres.) Died. on *Rheum rhaponticum*
Phlyctaena complanata (Berk. and Curt.) Sacc. on *Polygonum virginianum*** , *P. convolvulus*
Phoma demetriana Bubak on *Polygonum lapathifolium*
Phoma exigua Desm. on *Polygonum* sp. (N.Y.)
Phoma herbarum Westend. on *Rheum rhaponticum* , *Polygonum hydropiper*
Phyllosticta acetosellae A. L. Sm. and Ramsbottom on *Rumex acetosella* (Wisc.)
Phyllosticta circuligerens Tehon and Daniels on *Rumex altissimus* (Ill.)
Phyllosticta polygonorum Sacc. on *Fagopyrum sagittatum* , *Polygonum amphibium* (Wisc.), *Polygonum* sp. (Ill.)
Phyllosticta straminella Bres. on *Rheum rhaponticum*
Phyllosticta sp. on *Rumex acetosa* (N.Y.)
Rhabdospora polygoni Dearness and House on *Polygonum virginianum***
Septoria pleosporoides Sacc. on *Rumex acetosa* (Tex.), *R. acetosella* (Tex.)
Septoria polygonicola (Lasch) Sacc. on *Polygonum hydropiper*
Septoria polygonina Thuem. on *Polygonum cilinode***
Septoria polygonorum Desm. on *Polygonum amphibium* var. *emersum* , *P. aviculare* (Minn., Wisc.), *P. buxiforme* (N.Y.), *P. cilinode* (Wisc.), *P. convolvulus*** (Wisc.), *P. erectum* (Minn., Wisc.), *P. hydropiper*** , *P. lapathifolium* , *P. orientale* , *P. pensylvanicum*** , *P. persicaria*** , *P. scandens* (Vt.)
Septoria rhaponticae Thuem. on *Rheum rhaponticum* (Iowa)

- Septoria rumicicola* All. (*Septoria rumicis* Ellis) on *Rumex altissimus*, *R. orbiculatus*, *R. verticillatus*, *Rumex* sp. (N.Y.)
- Septoria rumicis* Trail (non Ellis) on *Rumex altissimus* (Wisc.), *R. triangulivalvis* (Ill., Kans., Nebr., Wyo.)
- Sphaeropsis rumicicola* Sacc. on dead stems of *Rumex* sp. (N.Y.)
- Sphaeropsis sphaerelloides* Ellis and Everh. on *Rumex crispus* (Ohio), *R. obtusifolius* (Ohio)

MELANCONIALES

- Colletotrichum erumpens* Sacc. on *Polygonum erectum*, *P. lapathifolium*, *Rheum rhaponticum* (Ill., Iowa, Mo., Okla., Pa., W. Va., Wisc.), *Rumex crispus*
- Cylindrosporium pulchrum* Speg. on *Rumex obtusifolius* (La.), *Rumex* sp. (Mo., S. Dak.)
- Excipula rumicicola* Sacc. on *Rumex verticillatus*
- Gloeosporium polygoni* Dearness and House on *Polygonum amphibium* var. *emersum*** , *P. persicaria* (Mass.)
- Gloeosporium rumicis* Ellis and Everh. on *Rumex acetosa* (N.Y., Tex.), *R. acetosella* (Tex.), *R. obtusifolius* (Tex.)
- Pestalotia polygoni* Ellis and Everh. on *Polygonum virginianum*
- Vermicularia dematium* (Pers.) Fr.* on *Polygonum aviculare*
- Vermicularia polygoni-virginici* Schw. on *Polygonum amphibium* var. *emersum*** , *P. virginianum*
- Vermicularia rugulosa* Ellis and Everh. on *Rumex crispus*

APPENDIX II

A List of Some Insects Associated with Polygonaceous Plants in New York State

HOMOPTERA

Cicadellidae

Empoasca fabae (Harris) Leaf Hopper on *Rheum rhaponticum*

Aphididae

Anuraphis roseus Baker on *Rumex*

Aphis armoraciae Cowen *Rumex obtusifolius*

Aphis fabae Scopoli *Fagopyrum sagittatum*, *F. tataricum*, *Polygonum aviculare*, *P. convolvulus*, *P. cuspidatum*, *P. persicaria*, *Rheum rhaponticum*, *Rumex crispus*, *R. longifolius*, *R. obtusifolius*, *R. patientia*, *R. verticillatus*

Aphis gossypii Glover *Rumex acetosella*, *R. crispus*

Aphis maidi-radici Forbes Corn Root Aphid on Smartweeds (*Polygonum* sp.)

Aphis menthaeradicis Cowen *Rumex obtusifolius*

Aphis nasturtii Kaltenbach *Rumex obtusifolius*

Aphis rumexicolens Patch *Rumex* sp.

Aphis rumicis L. *Rumex acetosella*, *R. crispus*, *R. obtusifolius*, *R. patientia*, *R. verticillatus*

Aphis spiraeicola Patch *Polygonum aviculare*

Aphis sp. *Rumex verticillatus*

Capitophorus braggii (Gillette) *Polygonum persicaria*

Capitophorus hippophoes (Walker) *Polygonum aviculare*, *P. pennsylvanicum*, *P. persicaria*, *P. setaceum*, *P. virginianum*

Capitophorus hippophoes var. *javanicus* Hille Ris Lambers *Polygonum persicaria*

Dactynotus sp. *Rheum rhaponticum*

Forda formicaria Heyden *Polygonum* sp.

Macrosiphum euphorbiae (Thomas) *Polygonum hydropiper*, *P. scandens*, *Rheum rhaponticum*, *Rumex obtusifolius*

Macrosiphum venafuscae Davis *Polygonum convolvulus*

Myzus persicae (Sulzer) *Polygonum convolvulus*, *P. hydropiper*, *P. persicaria*, *Rheum rhaponticum*, *Rumex crispus*, *R. obtusifolius*

Pemphigus brevicornis Hart *Rumex crispus*

Prociphilus erigeronensis (Thomas) *Rumex obtusifolius*

Prociphilus sp. *Rheum rhaponticum*

Toxoptera graminum (Rondani) *Fagopyrum sagittatum*

HEMIPTERA

Miridae

Adelphocoris rapidus (Say) Breeds on Docks (*Rumex* sp.)

Deraeocoris histrio (Reuter) Breeds on *Polygonum amphibium* var. *emersum*

Garganus fusiformis (Say) on Smartweed (*Polygonum* sp.)

Lygus plagiatus Uhler Feeds on Smartweed (*Polygonum* sp.)

Poecilocapsus lineatus (Fabricius) Four Lined Plant Bug on *Rumex* sp.

COLEOPTERA

Chrysomelidae

Colaspis flavida (Say) Grape Colaspis on *Fagopyrum sagittatum*

Gastroidea cyanea Melsh. on *Rumex*

Gastroidea polygona, L.

Pyrrhalta nymphaeae (L.) *Polygonum amphibium*

Systena hudsonias Forst. Smartweed Flea Beetle

Curculionidae

- Acanthoscelis acephalus* Say on *Polygonum* sp. especially *Polygonum hydropiper*
Acanthoscelis curtus Say *Polygonum* in swamps
Calandra oryzae L. *Fagopyrum sagittatum*
Ceutorhynchus neglectus Blatchley *Polygonum* sp.
Listronotus caudatus Say *Polygonum hydropiperoides*
Lixus concavus Say, The Rhubarb Curculio, *Rheum rhaponticum*, *Rumex crispus*, *R. obtusifolius*, *R. patientia*
Lixus musculus Say *Polygonum amphibium*
Lixus rubellus Rand. *Polygonum amphibium*
Lixus terminalis Lec. *Polygonum pennsylvanicum*
Pandeleiteius hilaris Hbst. *Polygonum* sp. (Smartweed)
Pelenomus sulcicollis Schön. on *Polygonum* sp. (Smartweed) in low ground
Phytonomus comptus Say *Polygonum* in wet places
Rhinoncus longulus Lec. on *Polygonum* sp.
Rhinoncus pericarpus Fab. on *Polygonum* sp.
Rhinoncus pyrrhopus Boh. common on *Polygonum pennsylvanicum* and *Rumex*
Tanymecus confertus Gyll. on *Polygonum* sp. (Smartweed)

LEPIDOPTERA

Coleophoridae

- Coleophora borea* Braun. *Polygonum scandens*
Coleophora shaleriella Chambers Seeds of *Polygonum punctatum*

Gelechiidae

- Aristotelia absconditella* Walker Larvae in stems of *Polygonum* (Slight gall)
Aristotelia minimella Chambers
Gelechia discellella Chambers Caterpillar on *Polygonum* sp. and *Rumex crispus*

Tortricidae

- Cymolomia fasciatana* Clemens Larva on *Rumex*

Pyralidae

- Pyrausta ainslei* Heinrich Larva boring in *Polygonum* in marshes

Lycaenidae

- Lycaena epixanthe* (Boisduval and LeConte) *Polygonum persicaria*, *Polygonum* sp., *Rumex orbiculatus*, *R. patientia*, *R. verticillatus*
Lycaena helleoides (Boisduval) *Polygonum amphibium*, *P. aviculare*
Lycaena hyllus (Cramer) *Polygonum* sp., *Rumex crispus*, *R. patientia*
Lycaena hypophlaeas (Boisduval) *Rumex acetosella*, *R. crispus*
Strymon melinus Hubner *Polygonum lapathifolium*

Sphingidae

- Hyles lineata* (Fabricius) *Fagopyrum sagittatum*, *Polygonum* sp., *Rumex obtusifolius*, *Rumex* sp. (Sorrels)

Arctiidae

- Apantesis arge* (Drury) *Polygonum* sp.
Apantesis nais Drury *Polygonum erectum*, *P. punctatum*
Apantesis virguncula (Kirby) *Polygonum aviculare*
Diacrisia vagans (Boisduval) *Rumex* sp. (Sorrels)
Diacrisia virginica (Fabricius) *Polygonum scandens*, *Polygonum* sp.
Estigmene acrea (Drury) Salt Marsh Caterpillar on *Polygonum amphibium*
Isia isabella Abbot and Smith Woolly Bear on *Polygonum persicaria*

Noctuidae

- Acrionicta oblongata* (Abbot and Smith) Smear-dagger Moth *Fagopyrum sagittatum*, *Polygonum hydropiper*, *P. punctatum*
Actebia fennica (Tauscher) *Rumex crispus*, *Rumex* sp. (Sorrels)
Agrotis ducens Walker *Rumex crispus*

Agrotis gladiaria Morrison *Rumex crispus*
Amathes badinodis (Grote) *Rumex crispus*
Amathes c-nigrum (L.) *Rumex* sp. (Sorrels)
Amphipyra tragopoginis (L.) *Rumex* sp. (Sorrels)
Ceramica picta (Harris) Zebra Caterpillar *Fagopyrum sagittatum*, *Polygonum hydropiper*
Chorizagrotis auxiliaris (Grote) *Rheum rhaponticum*
Dipterygia scabriuscula (L.) *Rumex* sp. (Sorrels)
Erastria carneola (Guenee) *Polygonum persicaria*, *Rumex crispus*, *Rumex* sp. (Sorrels)
Euxoa messoria (Harris) Dark-sided Cutworm *Fagopyrum sagittatum*
Euxoa tessellata (Harris) Striped Cutworm *Fagopyrum sagittatum*, *Polygonum* sp., *Rheum rhaponticum*,
Rumex sp. (Sorrels)
Faronta diffusa (Walker) *Polygonum convolvulus*
Feltia subterranea (Fabricius) *Polygonum aviculare*
Heliothis obsoleta Fabricius *Polygonum pensylvanicum*, *P. persicaria*
Lacinipolia renigera (Stephens) *Rumex crispus*
Laphygma frugiperda (Abbot and Smith) *Fagopyrum sagittatum*
Leuconycta lepidula (Grote) *Rumex* sp. (Sorrels)
Luperina passer (Guenee) Larvae in roots of *Rumex obtusifolius* and *R. verticillatus*
Nephelodes minians (Guenee) *Polygonum aviculare*, *P. hydropiper*, *Polygonum* sp.
Papaipema cataphracta (Grote) *Rheum rhaponticum*
Papaipema marginidens (Guenee) *Rumex* sp. (Sorrels)
Papaipema nebris (Guenee) *Polygonum hydropiper*, *Rheum rhaponticum*, *Rumex crispus*, *R. patientia*
Peridroma margaritosa (Haworth) Variegated Cutworm *Polygonum aviculare*, *Rheum rhaponticum*, *Rumex*
crispus
Plathypena scabra (Fabricius) Green Clover Worm *Polygonum hydropiper*, *Polygonum* sp.
Prodenia eridania (Cramer) *Rheum rhaponticum*, *Rumex* sp. (Sorrels)
Prodenia ornithogalli Guenee *Rheum rhaponticum*, *Rumex* sp. (Sorrels)
Pyrrhia umbra Hufnagel *Polygonum pensylvanicum*, *P. persicaria*
Simyra henrici (Grote) *Polygonum hydropiper*, *P. lapathifolium*
Spaelotis clandestina Harris *Fagopyrum sagittatum*
Sunira bicolorago (Guenee) *Rumex crispus*
Trichoplusia ni (Hubner) *Rumex* sp. (Sorrels)

Liparidae

Liparis dispar (L.) Gypsy Moth *Rumex altissimus*, *R. crispus*

Geometridae

Apicia confusaria (Hubner) *Polygonum* sp.
Euphyia centrostrigaria (Wolloston) *Polygonum aviculare*
Euphyia multiferata (Walker) *Polygonum aviculare*, *P. hydropiper*
Haematopsis grataria (Fabricius) *Polygonum aviculare*, *P. hydropiper*
Melanolopia canadaria (Guenee) *Polygonum* sp.
Percnoptilota obstipata (Fabricius) *Polygonum hydropiper*, *P. persicaria*, *Polygonum* sp.
Scopula quinquelinearia (Packard) *Polygonum* sp.
Timandra amaturaria Walker *Polygonum scandens* var. *cristatum*
Xanthotype sospeta Drury *Polygonum hydropiper*, *Polygonum* sp.

Papilionidae

Papilio philenor (L.) *Polygonum convolvulus*, *P. scandens*

HYMENOPTERA

Lasius niger americanus Emery Cornfield Ant *Polygonum* sp. (Smartweeds)

PLANT GALLS

Contarinia rumicis Loew, Dock Seed Midge reared from deformed *Rumex* seeds
Lestodiplosis rumicis Felt, reared from same gall as above

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Note: The following list contains nearly all of the references consulted in the preparation of this manuscript. It is presented here in its entirety so that persons interested in our taxonomic interpretations may seek out the literature without going through the time-consuming searches which we faced.

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LEGEND

For all illustrations in this publication the following letter-designations apply:

- | | |
|----------------------------------|-------------------------|
| A — Habit sketch | G — Root |
| B — 3-angled achene | H — Achene transections |
| C — Lens-shaped achene | I — Leaf outline |
| D — Partial inflorescence | J — Node |
| E — Perianth enclosing achene | K — Petiole |
| F — Perianth with exerted achene | |

For all maps in this publication the following symbols apply:

- Solid dot*specimen seen by author; data on file at the State Herbarium
- Circle*field observation with location data and observer's name of file
- Hollow triangle*...literature citation on file at the State Herbarium

