



FIG. 1. Plants of eight diploid *Fragaria* species in flower showing their range of morphological variation: (A) FDP001 *Fragaria daltoniana*; (B) FDP201 *F. iinumae*; (C) FDP401 *F. nilgerrensis*; (D) FDP501 *F. nipponica*; (E) FDP601 *F. nubicola*; (F) FDP702 *F. pentaphylla*; (G) FDP901 *F. viridis*; (H) FDP804 *F. vesca* subsp. *vesca*.

of the 19 accessions studied. Accessions of *F. vesca* and *F. nilgerrensis* were maximally separated by the morphological variance summarized by PC1, with accessions FDP807 (*F. vesca*) and FDP401 (*F. nilgerrensis*) being most widely separated on this axis due to the larger flowers, thicker stolons and petioles, and fewer stolons per plant of *F. nilgerrensis*, amongst other characters. Whilst separation

of other species accessions by PC1 was less than for *F. vesca* and *F. nilgerrensis*, the total variance summarized in the first three principal components between *F. vesca* and accessions of other species was consistently high. The analysis separated the accessions into three distinct groupings, one containing members of the species *F. vesca*, one containing members of *F. nilgerrensis* and a third grouping of

TABLE 5. A summary of the qualitative morphological characteristics assessed in eight diploid *Fragaria* species

Species	Plant and stolon habit	Foliage	Inflorescence structure	Flowers	Fruit
<i>F. daltoniana</i>	Small; low-growing; short petioles; few hairs on all plant parts; deciduous habit.  Stolons deep red; sympodial	Small waxy leaflets; prominent petiolules	Single flowered; fully erect in flower and fruit; flowers above foliage; peduncles absent	Small; ovate, prominently veined and widely spaced petals; calyx clearly visible; round receptacle; large flat anthers; short stamens	Conic to cylindrical; bright pink skin; purple to black achenes; white flesh; woolly texture; no aroma
<i>F. iinumae</i>	Small; stout plants; thick leathery petioles and stolons; annual habit, only daughter plants surviving the winter. Stolons pinky-red; thick and leathery; sympodial	Glabrous leaves with large serrations; short petiolules	Few flowers per inflorescence; few inflorescences per plant; short peduncles	Medium-sized; long slender petals, always more than five; small receptacles; large numbers of anthers; short stamens	Conic; bright red skin; soft watery flesh; bright yellow achenes; unpleasant, blackcurrant-like flavour; acidic
<i>F. nilgerrensis</i>	Robust; vigorous; long, thick leathery petioles; thick pubescence on all plant parts; evergreen habit.  Stolons deep-red; thick and leathery; sparsely produced; sympodial	Thick, leathery leaves; leaflets almost round; deep, prominent veins; distinct petiolules	Complex inflorescence, supporting many flowers; thick peduncles, erect to semi-erect in fruit	Medium sized; prominent, large round receptacles; narrow petals do not overlap; calyx clearly visible; large flat anthers	Globose-conic fruit; white skin; deeply pitted; firm flesh; small brown achenes; highly aromatic, peach-like aroma; clasping to spreading calyx
<i>F. nipponica</i>	Small; compact deciduous habit. Stolons pinky-red; slender and filiform; support a large number of daughter plants; monopodial	Many leaves that fold upwards with a bluish hue; insignificant petiolules	Simple inflorescence; peduncles droop when in fruit	Medium-sized; very small receptacle; almost circular petals; long prominent outer filaments	Short wedge-shaped berries; pinky-red skin; pleasant aroma like that of cultivated strawberry; long prominent calyx
<i>F. nubicola</i>	Small; not vigorous; few leaves; short petioles; remontant flowering habit; deciduous habit.  Stolons deep red; sympodial	Light-green leaflets, becoming darker around veins; short, almost absent petiolules	Simple inflorescence; few inflorescences per plant; peduncles clothed in thick pubescence; lie along ground in fruit; remontant flowering habit	Large; prominently veined petals small receptacle	Globose, necked berries; flattened on top; dark wine-red skin; tightly clasping calyx
<i>F. pentaphylla</i>	Compact; densely leafed; wavy petioles  Stolons deep red; monopodial	Leaflets shiny, almost leathery; petioles support tertiary leaflets	Relatively simple inflorescence; slender peduncles; flowers above foliage	Large; large, contorted, wrinkled petals	Long conic berries, almost rectangular; knobbly appearance; pink to orangy-red skin; sunken achenes. White fruited form has larger, rounder berries
<i>F. vesca</i>	Robust and vigorous; long, gracile petioles; evergreen habit; <i>americana</i> subsp. is in general smaller, more gracile and less vigorous  Stolons green to brown; many slender, filiform stolons; sympodial	Leaflets large; often curled under at edges	Complex inflorescence; peduncles stand erect in flower; <i>americana</i> subsp. has characteristically long pedicels and very short peduncles	Small; round, prominently veined petals; large receptacle; small anthers held on short filaments;  Subsp. <i>americana</i> has smaller flowers	Long-conic to globose; usually bright red; distinctive, powerful aroma; large achenes raised or in shallow pits; clasping to reflex calyx
<i>F. viridis</i>	Slender and erect; long, slender petioles; deciduous habit.  Stolons pinky-red; monopodial	Yellowish leaflets; petiolules almost absent	Complex inflorescence; peduncles above leaves in flower but lie along ground in fruit; remontant flowering habit	Large; medium sized receptacles; large, overlapping petals	Oblate to globose berries; pale green skin with a red blush; firm flesh; acidic apple-like aroma; very large achenes