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Elaeagnaceae—Oleaster family

Hippophae rhamnoides L.

common seabuckthorn

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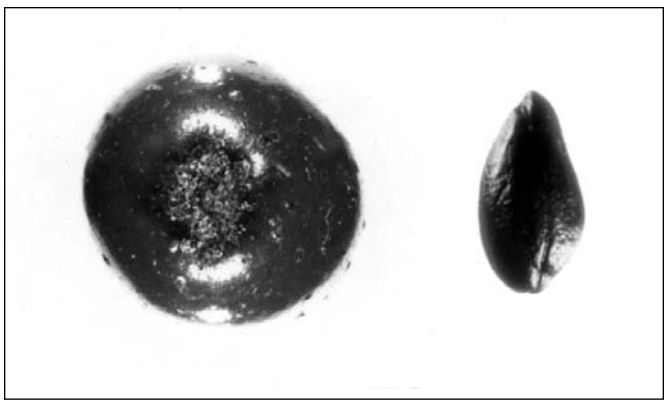
Other common names. Sandthorn, swallow-thorn.

Growth habit, occurrence, and use. Common seabuckthorn—*Hippophae rhamnoides* L.—is native to northwestern Europe through central Asia to the Altai Mountains, western and northern China, and the northern Himalayas. Of the 2 species in the genus, only common seabuckthorn is widely cultivated (Rehder 1940). A very hardy deciduous shrub or a small tree, common seabuckthorn is used primarily for ornamental purposes. In Europe and Asia, it is used to form hedges and, because of its nitrogen-fixing symbionts, serves to enrich and protect soils (Bogdon and Untaru 1967; Kao 1964; Stewart and Pearson 1967). A tendency to form thickets by root suckering limits its use in shelterbelts. In Asia, the plant has a variety of medicinal uses (Ma 1989). The berries, which are a rich source of vitamins (Stocker 1948; Valicek 1978; Zhmyrko and others 1978), have been used in making a cordial and jam in Siberia (Hansen 1931). The plant stems bear many sharp, stout thorns and provide protection, cover, and food for various birds and small rodents (Hansen 1931; Pearson and Rogers 1962).

Flowering and fruiting. The species is dioecious; its very small, yellowish, pistillate flowers appear in March or April before the leaves (Pearson and Rogers 1962; Slabaugh 1974). Orange-yellow, drupelike acidic fruits about the size of a pea (figure 1) (Rehder 1940) ripen in September or October (Hoag 1965; Hottes 1952) and frequently persist on the shrubs until the following March. Each fruit contains a bony, ovoid seed (figures 1 and 2). Seedcrops are borne annually.

Collection, extraction, and storage. Common seabuckthorn fruits are soft and cling tenaciously to the brittle twigs (Demenko and others 1983). Fruits may be picked from the bushes at any time between late fall and early spring. However, germination may vary with the time that seeds were extracted from the ripe fruits (Eliseev and Mishulina 1972). Seeds may be extracted by running the wet fruits through a macerator and floating off the pulp. Prompt cleaning and drying is advantageous because germination rate is very low for seeds left too long in the fruits (Eliseev and Mishulina 1977; Rohmeder 1942). From 45 kg (100 lb) of fruits, 4.5 to 14 kg (10 to 30 lb) of cleaned seeds may be extracted. Soundness of 85% and purity of 97% have been reported (Slabaugh 1974). The average number of cleaned seeds determined on 10 samples is 88,000/kg (40,000/lb), with a range of 55,000 to 130,000/kg (25,000 to 59,000/lb) (Slabaugh 1974). Smaller seeds, numbering 258,000 to 264,500/kg (117,000 to 120,000/lb), were reported in Romania (Enescu and Stegaroiu 1954). The seeds are orthodox and store easily at low moisture contents and temperatures. Dry seeds have been kept satisfactorily for 1 to 2 years at room temperature (Slabaugh 1974). Viabilty of 60% has been reported for seeds stored 4 to 5 years (Smirnova and Tikhomirova 1980).

Figure 1—*Hippophae rhamnoides*, common seabuckthorn: fruit and seed.



Germination. Internal dormancy in seeds of seabuckthorn can be broken by stratification in moist sand for 90 days at 2 to 5 °C (Cram and others 1960; Pearson and Rogers 1962). Stratification for 15 days is sufficient if seeds are sown in the autumn (Grover and others 1962). Germination tests may be run in 40 days on stratified seeds

Figure 2—*Hippophae rhamnoides*, common seabuckthorn: longitudinal section through a seed.

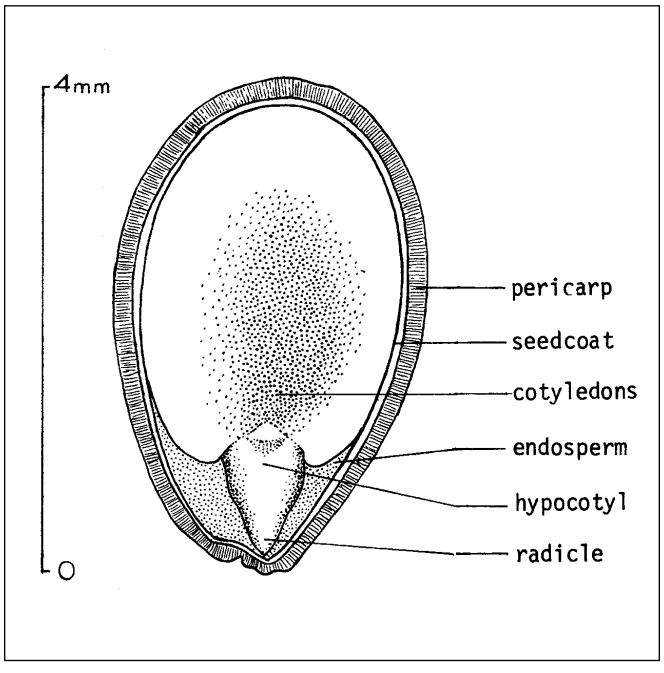
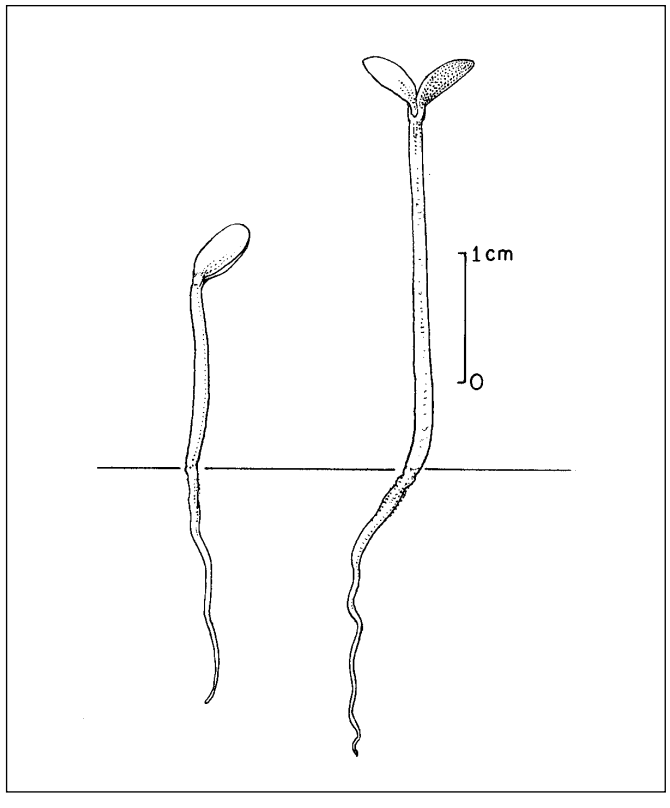


Figure 3—*Hippophae rhamnoides*, common seabuckthorn: seedling development at 1 and 7 days from germination.



in sand flats at diurnally alternating temperatures of 20 and 30 °C (Slabaugh 1974). Germination was increased slightly by exposure to light intensities up to 2,150 lumens/m^2 (Pearson and Rogers 1962). Soaking seeds in solutions of gibberellic acid, sulfuric acid, or other compounds, such as potassium iodide (KI), zinc sulfate ($ZnSO_4$), manganese sulfate ($MnSO_4$), or cobalt sulfate($CoSO_4$), may also increase germination (Avanzanto and others 1987; Eliseev and Mishulina 1972). Germination of untreated seeds ranged from only 6 to 60% after 60 days (Slabaugh 1974). Tests in Romania and England gave results of 75 to 85% and 95 to 100% (Enescu and Stegaroiu 1954; Pearson and Rogers 1962). Germination is epigeal (figure 3).

Nursery practice. Untreated seeds may be used for fall-sowing (Grover and others 1962), but stratified seeds are needed for spring-sowing (Cram and others 1960). Either broadcast or drill sowing is satisfactory if seeds are covered with about 6 mm ($^1/_4$ in) of soil. Shading during the early stages of germination is beneficial (Hansen 1927). This species can be propagated by layers, suckers, and root cuttings as well as by seeds (Avanzanto and others 1987; Papp 1982, Varga and Foldesi 1985). It grows best on moist, neutral to basic, sandy soils (Pearson and Rogers 1962).

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