

## An Unrecorded Naturalized Plant in Korea : *Cakile edentula* (Brassicaceae)

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Unrecorded species from the beach at Gangnung City is reported: *Cakile edentula*, Brassicaceae. The genus *Cakile* is unrecorded in Korea and easily distinguished from other genera in Brassicaceae by the upper member of fruits distinctly longer or thicker than the lower part, petiole white or anthocyanic, style absent and leaves glabrous. The local name is Seo-yang-gaet-naeng-i and the morphological characters and illustrations of the species are provided.

Key words: Brassicaceae, *Cakile edentula*, unrecorded naturalized plant

The Brassicaceae contains about 300 genera 3,000 species worldwide, especially cool regions, temperate zone and mainly distributed between the Mediterranean Sea and the Central Asia (Cronquist, 1981; Hickman, 1993; Lee, 1996). The genus *Cakile* is a small genus of succulent annual herbs found on sandy shores of North America and Europe. It contains about 8 species of plants constituting the genus *Cakile* (Weakley, 2007), of the mustard family (Brassicaceae), native to seashore regions of North America, Eurasia, western Asia, and Australia, and to central Arabian deserts. The younger leaves of *Cakile edentula* are reported to be used in salads whilst older leaves are mixed with milder tasting leaves and used as a potherb. Root dried and ground into a powder, then mixed with cereal flours and used to make bread (Usher, 1974; Yanovsky, 1980; Facciola, 1990; Schofield, 2003). A famine food, only used when all else fails (Coffey, 1993).

The main objective of this paper is to report an establishment of *Cakile edentula* in

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Korea, which is presumably introduced from Europe to the North America. It is found at the seashore of Gangnung City the first time in Korea.

## Description and Comments

**Description:** *Cakile edentula* (Bigelow) Hook. Flora Boreali-Americana 1(2): 59, 1830

Korean name: Seo-yang-gaet-naeng-i (서양갯냉이)

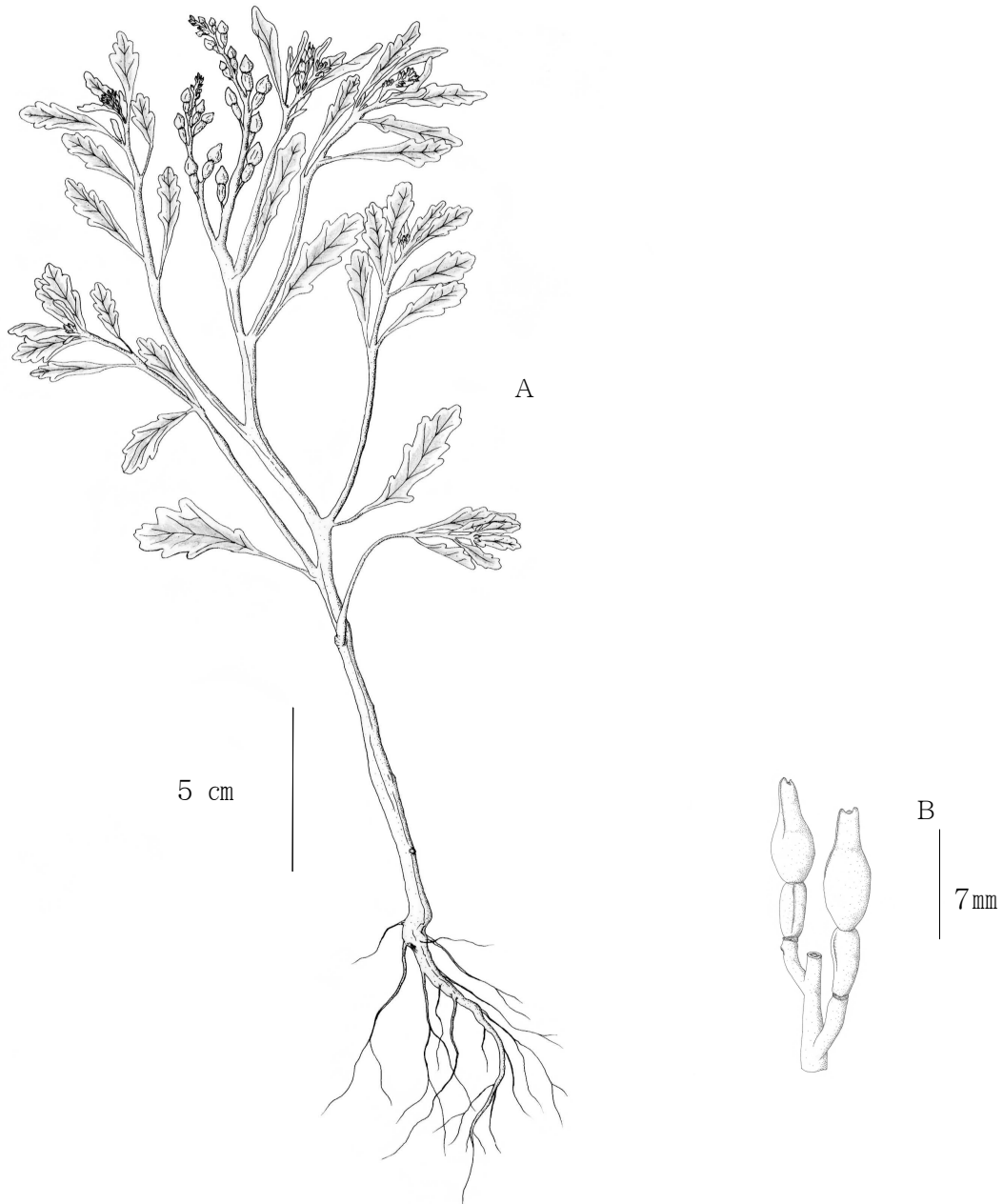
Common name: sea rocket

*Cakile edentula* grows on sandy or gravelly beaches above the high tide line. The stems and leaves are fleshy and succulent. Annual growing 10-50 cm tall, erect to spreading or decumbent. bushy with many branches. Basal leaves widely egg- or spoon-shaped, fleshy, deeply toothed to wavy-margined and saw-toothed, with a broad stalk, 2-7 cm long; stem leaves similar. Flower blooms at the terminal from June to August, and white to purple, 8 mm diameter, 4 parted with oblong petals. Inflorescence a raceme, 4-15 cm long; flower stalks 3-7 mm long, stout, ascending; petals white to purplish-tinged, 6-8 mm long; sepals sparsely soft-hairy at tip, early deciduous, 3-4 mm long. Fruits are fleshy, green and pod corky when dry, divided into two unequal parts, the top part larger, plumper and 4-angled. For the indehiscent segments, each falsely 1-chambered, generally 1-seeded. The seeds ripen from August to September. Siliques, 1.5-2.5 cm long, slightly to considerably constricted at the joints, the upper segment triangular to egg-shaped, constricted to somewhat flattened beak, tip acute to notched. The siliques of *Cakile* are divided near their middle by an abscission zone into two halves : the upper abscises and disperses by water or wind, the lower remains attached to the parent plant. The size of the two segments and the contour of the abscised surface remaining on the lower segment are important taxonomic characters (Weakley, 2007).

**Distribution:** It ranged from Europe and South-western North America (Hickman, 1993). In Japan, it was first reported in 1982 and widely shown on sandy beaches from Hokkaido to Tohoku (Shimizu *et al.*, 2001). In Korea, it is distributed along the Anmok beach and Hyangho, Jumunjin-eup, Kangnung city with a 80cm×100cm wide. The number of *C. cakile* population in the beach is still only one or two individuals with a large bushy-branched from a single root (Fig. 1). Those fruits of each individual ripen and



**Fig. 1.** *Cakile edentula* Hook. established in Gangnung sand dune, Gangnung City, Gangwon Province, Korea. Photo by K. S. Lee.



**Fig. 2.** *Cakile edetula* Hook. A: An individual plant, B: The shape of fruit (silique).

reproduced many seeds. The possibility of spread widely or invasion into other areas is up to research on the germination characteristics and growth pattern of this species. *Cakile edentula* is known as non-invasive weed to the other ecosystem and forms in a pure stand.

*Cakile edentula* Hook. can be distinguished from the other taxa as follows;

1. Upper member many times longer than the inconspicuous lower member .....  
..... Genus *Raphanus*
1. Upper member lanceolate to subglobose, not more than 4 times as long as the lower one
2. Upper member subglobose, not corky; petiole yellow; style elongate; leaves hirsute ....  
..... Genus *Rapistrum*
2. Upper member lanceolate to ovoid, corky; petiole white or anthocyanic; style absent; leaves glabrous ..... Genus *Cakile*
3. Lower fruit segment without lateral lobes or horns; early leaves wavy-margined or deeply dentate or irregularly shallowly lobed but not pinnately lobed; petals 0 or <3 mm wide, generally white, less often pale lavender ..... *Cakile edentula*
3. Lower fruit segment with 2 lateral lobes or horns; early leaves deeply pinnately lobed; petals 3-6 mm wide, lavender rarely white ..... *Cakile maritima*

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## 미기록 귀화식물: *Cakile edentula* (Brassicaceae)

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강릉시의 바닷가에서 채집한 서양갯냉이(*Cakile edentula* Hook.)를 국내 미기록 귀화식물로 보고한다. *Cakile*속은 국내에 처음 보고되는 속으로 십자화과에 속하며, 붓 모양의 열매가 2절로 나뉘는데 열매의 위쪽이 아래쪽보다 크고 엽병이 희고 화병이 없으며 잎에 털이 없다는 점에서 다른 속과 구분된다. 같은 *Cakile* 속이며 유럽 원산인 *Cakile maritima*는 꽃잎의 크기가 3~6 mm로 *C. edentula*보다 크고, 잎이 깃모양으로 깊게 파여 있다는 점에서 쉽게 구별할 수 있다. 2절로 나뉘어진 열매의 윗부분은 물이나 바람에 의해 산포되고 아랫부분은 모체에 붙어 있다.

주요어: 미기록 귀화식물, 서양갯냉이, 십자화과

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