**Rorippa apetala: A new species of Rorippa Scopoli.**
**(Brassicaceae) from Korea**

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**Abstract:** Herein is described a new species of *Rorippa* (*R. apetala*, Brassicaceae) discovered on the River Seom-gang in Wonju-si, Gangwon-do, Korea. The new species is distinct from the closely-related species, *R. palustris* and *R. globosa*, by having adventitious buds on the surface of rhizome-type roots during the fruiting season, usually absent or rarely 1–4, if present then atrophy petals, opbundurate fruits, and seeds usually empty or rarely 1–2 per locule. The key to these species is provided.

**Keywords:** Brassicaceae, *Rorippa* Scopoli., new species, *Rorippa apetala*

**Abstract:** Gwakjanggaetgnyeo (매추과)의 성장능이쪽의 산장남영이가 한국의 강원도 원주시 성강에서 발견되어 기재하였다. 

성장능은 절기별로 각기 시기하는 것이며, 일반적으로 무관화가거나 드물게 1–4개의 축소된 화판, 도체금형의 열매, 종자가 대부분 결실하지 않거나 드물게 성장 1–2개를 가짐으로써, 근연종인 속속이품 (R. palustris) 및 구습간이류 (R. globosa)와 구별하게 구별되었다. 본 연구에서 이 종들의 검체표를 제시하였다.

**Keywords:** 매추과, 개장념이속, 산장, 성장개각영이

Brassicaceae are one of the largest angiosperm families, comprising approximately 340 genera and more than 3,350 species (Cheo et al., 2001; Ilim, 2008). The family is divided into 10-19 tribes (Schulz, 1936; Janchen, 1942; Al-Shehbaz, 1984; Onyilagha et al. 2003). The genus *Rorippa* Scopoli. belongs to the tribe Arabidaceae and has approximately 70–80 species distributed throughout all the continents except for Antarctica (Stuckey, 1972; Cheo et al., 2001). Five taxa have been recorded in Korea (Park et al. 2003; Oh, 2007).

In this study, one uncertain species, which was collected from the Gangwon Province in 2008, is described as a new species, *Rorippa apetala*.

**Rorippa apetala** Y.Y. Kim & B.U. Oh, sp. nov. (Figs. 1, 2, 3)  
Hae species *R. palustris* (L.) Besser. et *R. globosa* (Turcz.)

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Hayek. similares, sed, gemmae adventitiae ad radicalis, petala absens vel raro 1-4, fructus opbundurate, semina cassis vel raro 1-2.

**Holotype:** KOREA. Province Gangwon-do, Wonju-si, Jijeong-myeon, Anchang-ri, Seomgang, A gravelly- or sandy-fields in the riverside, alt. 57 m, 37°20'06.69N, 127°49'04.38E, 2 Jun. 2009, B.U. Oh et Y.Y. Kim, 090602-004 (CBU)

**Isotypes:** CBU.

**Paratypes:** B.U. Oh et Y.Y. Kim, 080624-001 to 080624-004, B.U. Oh et Y.Y. Kim, 080701-001 to 080701-008 (CBU).

**Herbs** perennial, usually with hisrate or rarely glabrous, 30–150 cm tall. **Roots** taproots, rootlets fibrous. **Stems** erect, green to purple, usually branching upper parts. **Leaves** basal and cauline. Basal leaves rosulate during the autumn, petiole up to 4.0 cm long, simple, 3–9-pinnatisect, withered during the winter; cauline leaves alternate, sessile, simple, 1–9-pinnatisect except for the
Fig. 1. Holotype of *Rorippa apetala* Y.Y. Kim & B.U. Oh.
terminal leaves; leaf blades lyrate-pinnatifid or lanceolate at the terminal, up to 25 cm long, up to 6 cm width, apex obtuse or acute, margin irregularly dentate or crenate, base auriculate. **Inflorescence** racemose; peduncles green to purple, 1–4 each branching, erect or ascending, 2.0–20.0 cm long, glabrous; pedicels green, 2.7–4.2 mm long; cuneate. **Flowers** yellow to greenish yellow. **Sepals** 4, yellow to greenish yellow, elliptical, 1.0–1.8 mm long, 0.4–0.6 mm wide. **Petals** absent or rarely 1–4, yellow, atrophy, spatulate, up to 1.6 mm long, 0.4–0.5 mm wide. **Stamens** 5–7, superior ones 5–6, 1.4–1.8 mm long, inferior one usually
Fig. 3. Photographs of *Rorippa apetala* Y.Y. Kim & B.U. Oh. A. Habit; B. Stems (a: stem from last year, b: stems from this year); C. Adventitious buds on rhizome (arrows); D. Hirsute on stems and leaves; E. Inflorescence; F. Flowers; G. Fruits.
absent or rarely 1, atrophic, up to 0.7 mm long; filaments yellow, linear; anthers yellow, versatile, superior ones oval, ca. 0.3 mm long, ca. 0.2 mm wide, inferior one atrophic. **Pistil** 1; ovary yellowish-green, oblong-cylindrical to obpandurate-cylindrical, 1.2–1.4 mm long, ca. 0.7 mm wide; ovules 20–30 per locale; style ca. 0.4 mm long; stigma truncate, papillate. **Fruits** silicles, brown to reddish brown, obpandurate, 1.6–2.3 mm long, 0.8–1.2 mm wide, valves not veined; style ca. 0.4 mm long. **Seeds** empty or rarely 1–2 per locale, brown, oval, ca. 0.7 mm long, ca. 0.5 mm wide, faveolate. **Flowering** May to July. **Fruiting** June to July.

**Korean name:** Seon-gang-gae-gat-naeng-i (삼강개각냉이)

Morphologically, *Rorippa apetala* resembles *R. palustris*, by having deeply pinnatifid leaves, and *R. globosa*, by having the same flowering season and, similar size of fruits. However, it is distinct from *R. palustris* and *R. globosa*, which are supposed to be two of the most closely-related species, by having adventitious buds on the surface of rhizome type roots during the fruiting season, usually absent or rarely present only one petal, and obpandurate fruits (Table 1, Figs. 4, 5). Meanwhile, *R. dubia* has apetalous

**Table 1. Diagnostic characters of *R. palustris*, *R. globosa* and *R. apetala*.**

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>R. palustris</em></th>
<th><em>R. globosa</em></th>
<th><em>R. apetala</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbs</td>
<td>glabrous</td>
<td>hirsute</td>
<td>hirsute or rarely glabrous</td>
</tr>
<tr>
<td>Buds</td>
<td>axillary</td>
<td>adventitious</td>
<td>adventitious</td>
</tr>
<tr>
<td>Petals</td>
<td>4</td>
<td>4</td>
<td>absent or rarely 1–4</td>
</tr>
<tr>
<td>Stamens</td>
<td>6</td>
<td>6</td>
<td>5–6 (7)</td>
</tr>
<tr>
<td>Ovaries</td>
<td>ovate</td>
<td>globose to subglobose</td>
<td>oblong-cylindrical to oblong-cylindrical</td>
</tr>
<tr>
<td></td>
<td>0.8–1.0 × 0.5–0.6 mm</td>
<td>0.8–1.4 × 0.7–1.0 mm</td>
<td>1.2–1.4 × 0.7 mm</td>
</tr>
<tr>
<td>Ovules</td>
<td>15–40 per locale</td>
<td>20–40 per locale</td>
<td>20–30 per locale</td>
</tr>
<tr>
<td>Fruits</td>
<td>ellipsoid to oblong-ovoid</td>
<td>globose to subglobose</td>
<td>obpandurate-cylindrical</td>
</tr>
<tr>
<td></td>
<td>2.5–10.0 × 1.5–3.5 mm</td>
<td>2.0–3.5 × 1.5–3.0 mm</td>
<td>1.6–2.3 × 0.8–1.2 mm</td>
</tr>
<tr>
<td>Seeds</td>
<td>15–40 per locale</td>
<td>20–40 per locale</td>
<td>0 (1–2) per locale</td>
</tr>
<tr>
<td></td>
<td>ovate to oval</td>
<td>broadly ovate</td>
<td>oval</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>May–Jul.</td>
</tr>
</tbody>
</table>

**Fig. 4.** Flowers of *Rorippa apetala* and those of the closely-related species. A. *R. palustris*, B. *R. globosa*; C. *R. apetala*.

**Fig. 5.** Fruits of *Rorippa apetala* and those of the closely-related species. A. *R. palustris*; B. *R. globosa*; C. *R. apetala*.
flowers, but one has been recorded as a closely-related species of *R. indica* (Cheo et al., 2001). The habitat of *R. apetala* is a gravelly- or sandy-fields on the riverside, and the community of the new species is often affected by floods. Individual plants are scattered along more than 60 km of the Rivers Scom-gang and Namhan-gang. This species grows with other species such as *Rorippa palustris*, *R. globosa*, *R. cantoniensis*, *Persicaria hydropiper* var. *hydropiper*, *Oenothera biennis*, *Conyza canadensis*, *Erigeron annuus*, and *Phragmites japonica*.

**Key to Rorippa apetala and related species of Rorippa Scop.**

1. Basal leaves pinnatipartitive or undivided; fruits linear or rarely linear-oblong, length longer than four times the size of width.
   2. Petals 4, longer than sepals; fruit curved or rarely straight, 10–25 mm long, 1–2 mm wide. Seeds biserial
   ........................................................................................................... *R. indica*

2. Petals absent or rarely present, if present then shorter than sepals; fruit straight, 15–40 mm long, 0.7–1 mm wide; seeds uniseriate
   ........................................................................................................... *R. dubia*

1. Basal leaves pinnatisect; fruits oblong to oblong-ovoid, globose to subglobose, obpandurate-cylindrical, length shorter than three times the size of width.
   3. Ovary ovate, shorter than 1.0 mm; style shorter than 0.3 mm
   ........................................................................................................... *R. palustris*

3. Ovary globose to subglobose or oblong-cylindrical to obpandurate-cylindrical, longer than 1.0 mm; style longer than 0.3 mm.
   4. Petals 4; stamens 6; ovary globose to subglobose; fruit globose to subglobose, 2.0–3.5 mm long, 1.5–3.0 mm wide; seeds 20–30 per locale
   ........................................................................................................... *R. globosa*

4. Petals absent or rarely 1–4; stamens 5–6 or rarely 7; ovary oblong-cylindrical to obpandurate-cylindrical; fruit obpandurate-cylindrical, 1.6–2.3 mm long, 0.8–1.2 mm wide; seeds empty or rarely 1–2 per locale
   ........................................................................................................... *R. apetala*

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**Literature Cited**


