Short Communication

A New Locality of Adonis multiflora (Ranunculaceae) in Japan

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The large population of Adonis has been known from Hiroshima Prefecture, western Honshu, Japan. The Adonis species was formerly regarded as A. ramosa. However, based on detailed examinations of flowers and fruits, this species is here identified as A. multiflora. This is the first report of A. multiflora from western Honshu, Japan.

Key words: Adonis multiflora, Hiroshima Prefecture, Honshu, Japan, new locality

The large Adonis population around Taishaku-kyo Gorge, northeast of Hiroshima Prefecture, was previously considered to be A. ramosa Franch. (Yamashita 1987, Kaneko et al. 2002, Hiroshima Prefecture 2004), and this was because A. ramosa was believed to be the only Adonis species native to Japan (Ohwi 1983). However, recent studies (Nishikawa & Ito 1978, 1979, 2001, Nishikawa 1988, 1989a, 1989b) have shown that the Japanese Adonis consists of the following four species; A. amurensis Regel & Radde, A. ramosa, A. multiflora Nishikawa & Ko. Ito (Nishikawa 1989a) and A. shikokuensis Nishikawa & Ko. Ito (Nishikawa & Ito 2001). In this report morphological characters of flowers and fruits were examined to enable the exact determination of the Adonis species in this area.

To confirm the identification of the Adonis species in Hiroshima Prefecture, the ratio of the sepal length to petal length, the ratio of aggregate fruit length to width, the length of aggregate fruit, and the number of achenes per aggregate fruit were measured in the three populations. The length of aggregate fruit and the number of achenes per aggregate fruit were also examined in the six populations, including four Adonis species from other localities in Japan (Fig. 1). Voucher specimens are deposited at Hiwa Museum of Natural History, Shobara, Hiroshima Prefecture.

Adonis multiflora is morphologically similar to A. ramosa in having several branches with one flower per stem, with alternate leaf arrangement and leaves which are glabrous but rarely hairy underneath (Nishikawa 2001). The two species differ from each other in terms of the ratio of sepal length to petal length, the shape of aggregate fruits, and particularly the length of aggregate fruits and the number of achenes per aggregate fruit. Adonis multiflora has sepal 1/2-2/3 shorter than petals, with spherical aggregate fruits, having 35 achenes on average. On the other hand, A. ramosa has sepal nearly equal to petals, and prolate spheroid aggregate fruit with 55 achenes (Nishikawa 1988, Nishikawa & Ito 2001).

The ratio of sepal length to petal length of
Adonis species around Taishaku-kyo Gorge in Hiroshima Prefecture was 0.71 ± 0.10 (range: 0.49 - 0.94, N = 90), and their length were 10.7 ± 2.16 mm (range: 5.2 - 16.1mm, N = 90) and 15.7 ± 3.43 mm (range: 8.5 - 26.4mm, N = 90). These plants had sepals clearly shorter than their petals. The ratio of aggregate fruit length to width was 0.98 ± 0.06 (range: 0.85 - 1.05, N = 90), and these plants had spherical aggregate fruits. Figure 1 shows the length of aggregate fruit and the number of achenes per aggregate fruit. The present Adonis species was not significantly different from A. multiflora, but significantly different from the other three species of Adonis (A. ramosa, A. amurensis, and A. shikokuisis). Based on these results, the Adonis species found around Taishaku-kyo Gorge in Hiroshima Prefecture should be ascribed to A. multiflora, and not A. ramosa.

Nishikawa & Ito (2001) reported the distribution of Adonis multiflora in northern Honshu and Kyushu. However, the Adonis species reported in western Honshu was regarded as A. ramosa (Environmental Agency 2000, Hiroshima Prefecture 2004, Shimane Prefecture 2004), not A. multiflora. The presence of A. multiflora in Hiroshima Prefecture showed that this species is distributed in western Honshu. Hence there is a possibility that in western Honshu, Hiroshima Prefecture, A. multiflora is found also at other localities in the vicinity of Taishaku-kyo Gorge.

The population of Adonis multiflora located around the Taishaku-kyo Gorge, Hiroshima Prefecture, is also worthy of special mention for conservation of this species, and at least ten thousand individuals are found in this area. According to the Environmental Agency of Japan (2000), the estimated number of individuals of A. multiflora in Japan was approximately ten thousands. Therefore the population of A. multiflora in Hiroshima could be one of the largest stocks of this threatened species in Japan.
Reference


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