

## Habitat of *Astragalus sikokianus* in Korea (Fabaceae)

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**Abstract** : In order to facilitate the future reintroduction and cultivation of *Astragalus sikokianus* in Japan, we have collated data on the species' habitat in Korea. In contrast to the situation in Japan, this species is found in Korea not only in coastal areas but also in mountainous regions, which are characterised by open, well-drained terrain.

**Key words** : Habitat, Fabaceae, Extinct in the wild

*Astragalus sikokianus* Nakai is a perennial herb in the genus *Astragalus* of the Fabaceae described by Takenoshin Nakai in 1953 (Ohashi 1982, 2016). At the time of its discovery, this species was considered endemic to Naruto City, Tokushima Prefecture, but soon after its discovery it became extinct in the wild in Japan (Akasawa 1992). It has since been found to be isolated in Korea and northwestern China (Kim et al., 2003; Choi et al., 2015; 2016). According to Choi et al. (2016), geohistorical changes in the flow path of the Yellow River and the action of ocean currents from the Korean Peninsula to the Japanese archipelago may have influenced the isolated distribution of this species.

In Japan, this species was once thought to be extinct, but 20 years later, preserved seeds were successfully germinated (Asahi Shimbun, 1973; 1974, Mainichi Shimbun, 1973; Yomiuri Shimbun, 1973; Tokushima Shimbun, 1973; Kinoshita, 2005; Ogawa and Kinoshita, 2017). In Tokushima Prefecture, the only place where this species has been found in Japan, it has been cultivated in the ground or in pots by some volunteers for the purpose of conservation and propagation. As a result, seeds stored at room temperature for a long period of time have been used to flower and bear fruit in potted plants and in open field cultivation, and new seeds have been secured. It has also been cultivated at public institutions such as the Tokushima University (Imabayashi 2021), Setsunan University, Osaka, and the Makino Botanical Garden in Kochi. Attempts have also been made to reintroduce the species to its native habitat in the wild (Tokushima Shimbun 1974), but these have not been successful.

In this paper, we aim to collate data on the natural habitat of

*Astragalus sikokianus* in Korea, which is currently unstudied in Japan. This information will serve as a reference point for initiatives seeking to restore the species' natural habitat in Japan. The subsequent chapters refer to both mountainous and coastal habitats in Korea, with a particular focus on soil characteristics, solar radiation, and moisture conditions.

### 1. The Habitat of *Astragalus sikokianus* in Mountainous Areas of Korea

*Astragalus sikokianus* prefers sunny places, often found along riversides or roadsides (Figs.1-3). Generally, not dry. Frequently observed in areas with gravel, which appears to aid in maintaining a certain level of humidity and providing good drainage.

*Astragalus sikokianus* is found in disturbed grasslands,



Fig.1. Habit of *Astragalus sikokianus* in Sinwol-ri, Nam-myeon, Inje-gun, Gangwon-do.

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Fig.2. Habitat along the river in Jeongseon-gun, Gangwon-do.



Fig.3. Roadside habitat in Jeongseon-gun, Gangwon-do.

accompanied by a variety of plants from the Asteraceae and Fabaceae. These plants typically grow less than 50 cm tall, allowing the species ample sunlight exposure.

## 2. The Habitat of *Astragalus sikokianus* in Coastal Areas of Korea

The following section provides a detailed account of the coastal habitats of *Astragalus sikokianus* in several locations in Korea, with a focus on the specific characteristics of each site. It is noteworthy that the sunlight conditions in these coastal habitats are characterized by openness and brightness, a quality also observed in mountainous regions.

**Incheon:** This species grows around embankment paths. This population is under periodic disturbance. The soil is ordinary, not mud or sand (Figs.4-7).

**Samcheok-si, Gangwon-do:** Individuals were discovered near



Fig.4. Habitat in Ganghwa-gun, Incheon.



Fig.5. Habitat of Ganghwa-gun, Incheon. The species grow around embankment paths under periodic disturbance.



Fig.6. Habitat of *Astragalus sikokianus* in Ganghwa-gun, Incheon.



Fig.7. Habitat of Ganghwa-gun, Incheon. There are about 20 individuals growing in the roadside grassland.





Fig.8. Habitat of Samcheok-si, Gangwon-do. It also grows under pine trees. Photo taken by Se Hwan Hwang.



Fig.9. *Astragalus sikokianus* grows along the road, in generally moist soil conditions, at Yeongdeok-gun, Gyeongsangbuk-do.

a building, situated behind the beach dune. The soil in this area is a mixture of common soil and sand. It also grows under pine trees (Fig.8).

**Yeongdeok-gun, Gyeongsangbuk-do:** The plant grows behind guardrails along the river road, in generally moist soil conditions (Figs.9-10).

**Pohang-si, Gyeongsangbuk-do:** This species grows on a gentle slope adjacent to a coastal road hill, growing in general soil conditions (Fig.11).

**Saemiseom Isl., Sinan-gun, Jeollanma-do:** This species has only been observed as a specimen. Local people mention that it used to be very common around the nearby uninhabited islands.

### 3. The habitat of *Astragalus sikokianus* in Japan



Fig.10. The plant grows behind guardrails in the habitat of Yeongdeok-gun, Gyeongsangbuk-do.



Fig.11. *Astragalus sikokianus* grows on a gentle slope adjacent to a coastal road hill in Pohang-si, Gyeongsangbuk-do.

As for the native habitat of this species in Japan, where it occurs in open sand and gravel areas along the coast, it is not known to occur in mountainous habitats. In the present study, the habitat of this species in Korea was compiled to include not only coastal habitats but also mountainous habitats. The species was found to have a much wider range of habitat preferences than that observed in Japan. However, there were some similarities, such as the observation that all habitats were found in open, light areas. As a result, new information was obtained about the growing conditions of this species. To summarize the growing environment of this species, it can be mixed with other plants, but only if they are not too tall and do not block the sunlight to such an extent that this species is not disturbed. The soil type is not restricted but should be sufficiently moist and well drained.

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## 摘要

韓国におけるナルトオウギ *Astragalus sikokianus* の生育環境

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日本におけるマメ科ゲンゲ属の野生絶滅種、ナルトオウギの栽培方法の確立と、自生地への再導入方法についての基礎的情報を得るため、韓国における本種の生息地に関するデータを収集した。日本とは対照的に、韓国では沿岸部だけでなく、水はけの良い開けた地形を特徴とする山間部にも生息していることなど、新たな知見が得られた。