Scrophularia koraiensis, a new synonym to Scrophularia kakudensis (Lamiales: Scrophulariaceae)

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Scrophularia Linnaeus (1753: 619), is one of the largest genera of Scrophulariaceae, includes about 270 exant species, and is predominantly distributed in Holarctic regions of both the Old and New World (Olivencia, 2009; Olivencia & Devesa, 1993). Scrophularia koraiensis was first described by Nakai (1909) based on material collected in mount Kum-gang san, Kang-uŏn, Korea and considered as an endemic medicinal plant of Korea (Han et al. 2003). S. koraiensis was characterized by having petiole 4 to 7 cm long, blade ovate–lanceolate, 10 to 15 cm long, terminal or axillary cymes, pedicels glandular hairy and ovate capsule (Nakai 1909).

Our phylogeny research of eastern Asian Scrophularia based on ITS, trnL–trnF, trnQ–rps16 and psbA–trnH showed that S. koraiensis from Korea was embedded in S. kakudensis branch, and formed a strong clade with individuals of S. kakudensis from Korea (KO1), Northeastern of China (XY2), Tochigi (RG1) and Tsukuba in Japan (CC2) (Figure 1, Table1).

Therefore, we examined the type specimens of S. koraiensis and S. kakudensis, as well as living plants, and found them to be indistinguishable. They are also both medicinal herb and have similar chemical component for treatment of measles, smallpox, chickenpox, and scarlet fever (Yamamoto et al. 1993; Lee 2010). S. kakudensis exhibit quadrangular, white pilose stem, petiole 4 cm long, leaf blade ovate to narrowly ovate, 5–12cm, peduncle and pedicels glandular hairy, terminal or axillary cymes and broadly ovoid capsule, with an extensive range from Korea, Liaoning Province, China to Japan (Hong et al. 1998). Here, we propose S. koraiensis as a synonym of S. kakudensis.

Formal treatment

Scrophularia kakudensis Franch. (1879: 26). Type:—NIPPON. Etchigo: from Urben Niigata to Kakuda Yama, 13 June 1879, R.P. Faurie (P!).
= Scrophularia koraiensis Nakai (1909: 23), syn. nov. Type:—KOREA. Kang-uŏn: Mount Kum-gang San, 18 August 1902, T. Uchiyama (TI!).

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**FIGURE 1.** Phylogram of the best maximum likelihood tree. Statistical support (maximum likelihood bootstrap value ≥ 45/ maximum parsimony bootstrap value ≥ 50/ Bayesian posterior probability ≥ 0.80) are indicated on the branches.