

## Two new records of linyphiid spiders (Araneae: Linyphiidae) from Korea

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**Abstract:** Two linyphiid spiders, *Saitonia kawaguchikonis* Saito & Ono, 2001 and *Asthenargus nipponius* Saito & Ono, 2001 were confirmed from Korea for the first time. Males of *S. kawaguchikonis* and a female of *A. nipponius* were collected with pitfall traps in a leaf litter of mixed forests in three National Parks (Hallyeohaesang National Park, Mt. Naejangsan, and Mt. Sobaeksan) during the seasonal surveys for the spider fauna in mountainous terrain from 2018 to 2020. These two species were formerly known from China and Japan, or only from Japan, respectively. The present study describes these two species with measurements, morphological illustrations, and a distribution map. This report adds the genus *Asthenargus* Simon & Fage, 1922 from Korea to the Korean spider fauna for the first time.

**Keywords:** *Asthenargus nipponius*, *Saitonia kawaguchikonis*, Linyphiidae, description, taxonomy

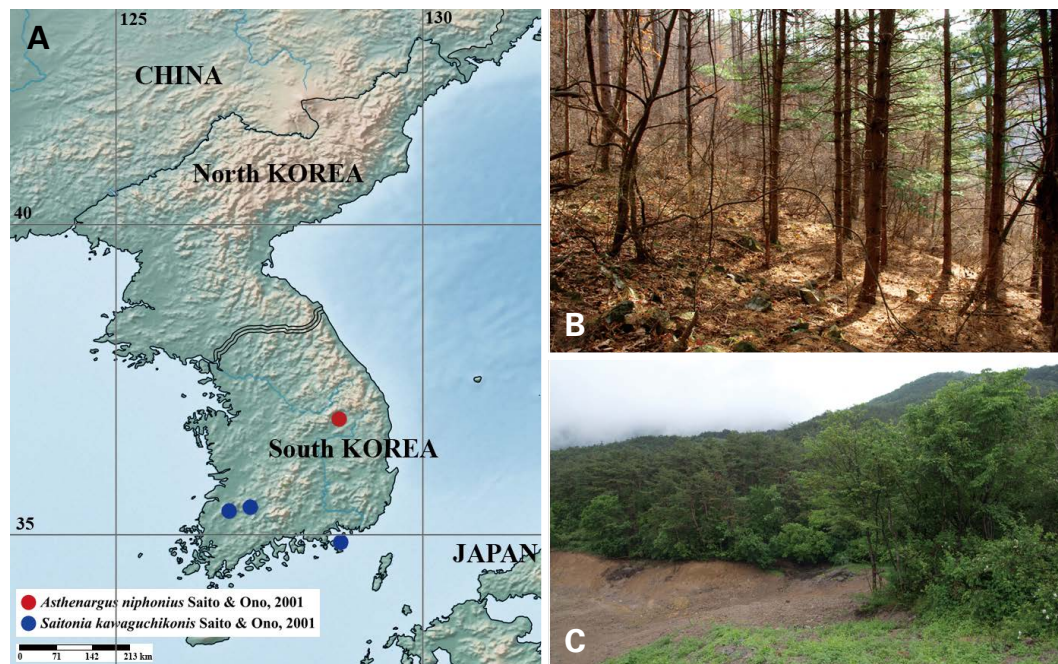
## INTRODUCTION

Spiders in the family Linyphiidae Blackwall, 1859 are usually dominant in spider fauna of warm and cold temperate regions of the Northern Hemisphere, including arctic and polar areas (Saito and Ono 2001). The family is one of the most diverse and largest one within the order Araneae Clerck, 1757, comprising 4,695 species (World Spider Catalog 2021). In Korea, 129 species of 61 genera have been described from various ecosystems in Korea (Kim 2019; World Spider Catalog 2021). During the seasonal surveys of the spider fauna in mountainous terrain particularly of the National Parks of Korea in 2018 to 2020, four males of *Saitonia kawaguchikonis* Saito & Ono, 2001 and one female

of *Asthenargus nipponius* Saito & Ono, 2001, were collected with pitfall traps in leaf litter of mixed forests from five locations within three National Parks (Fig. 1). Formally, *S. kawaguchikonis* was known from China and Japan, and *A. nipponius* was reported from Japan only. These two species are described with measurements, morphological illustrations, and a distribution map. The genus *Asthenargus* Simon & Fage, 1922 is reported for the first time in Korea.

## MATERIALS AND METHODS

External morphology was examined and illustrated using a stereoscopic dissecting microscope (S8APO; LEICA, Sin-



**Fig. 1.** Distribution of *Saitonia kawaguchikonis* Saito & Ono, 2001 and *Asthenargus niphonius* Saito & Ono, 2001 in Korea (A), the collection site of *A. niphonius* (Mt. Sobaeksan) (B), and the collection site of *S. kawaguchikonis* (Mt. Naejangsan) (C).

gapore). Habitus photographs were taken with a CANON 650D with 60 mm macro-lens. Measurements of body parts were made with an ocular micrometer and are recorded in millimeters. Leg and palp (left) measurements are given as leg number, total length (femur, patella, tibia, metatarsus, tarsus). Terminology of morphological characters follows Eskov (1992) and Saito and Ono (2001). Abbreviations are as follows: ALE = anterior lateral eye, AME = anterior median eye, PLE = posterior lateral eye, PME = posterior median eye, AER = anterior eye row, PER = posterior eye row. The examined specimens of this study were deposited in the collection of the National Institute of Biological Resources (NIBR), the Republic of Korea.

## TAXONOMIC ACCOUNTS

Family Linyphiidae Blackwall, 1859

Genus *Saitonia* Eskov, 1992

Type species: *Araeoncus muscos* Saito, 1989.

**Diagnosis.** For detailed diagnosis and description, see Eskov (1992).

*Saitonia kawaguchikonis* Saito & Ono, 2001

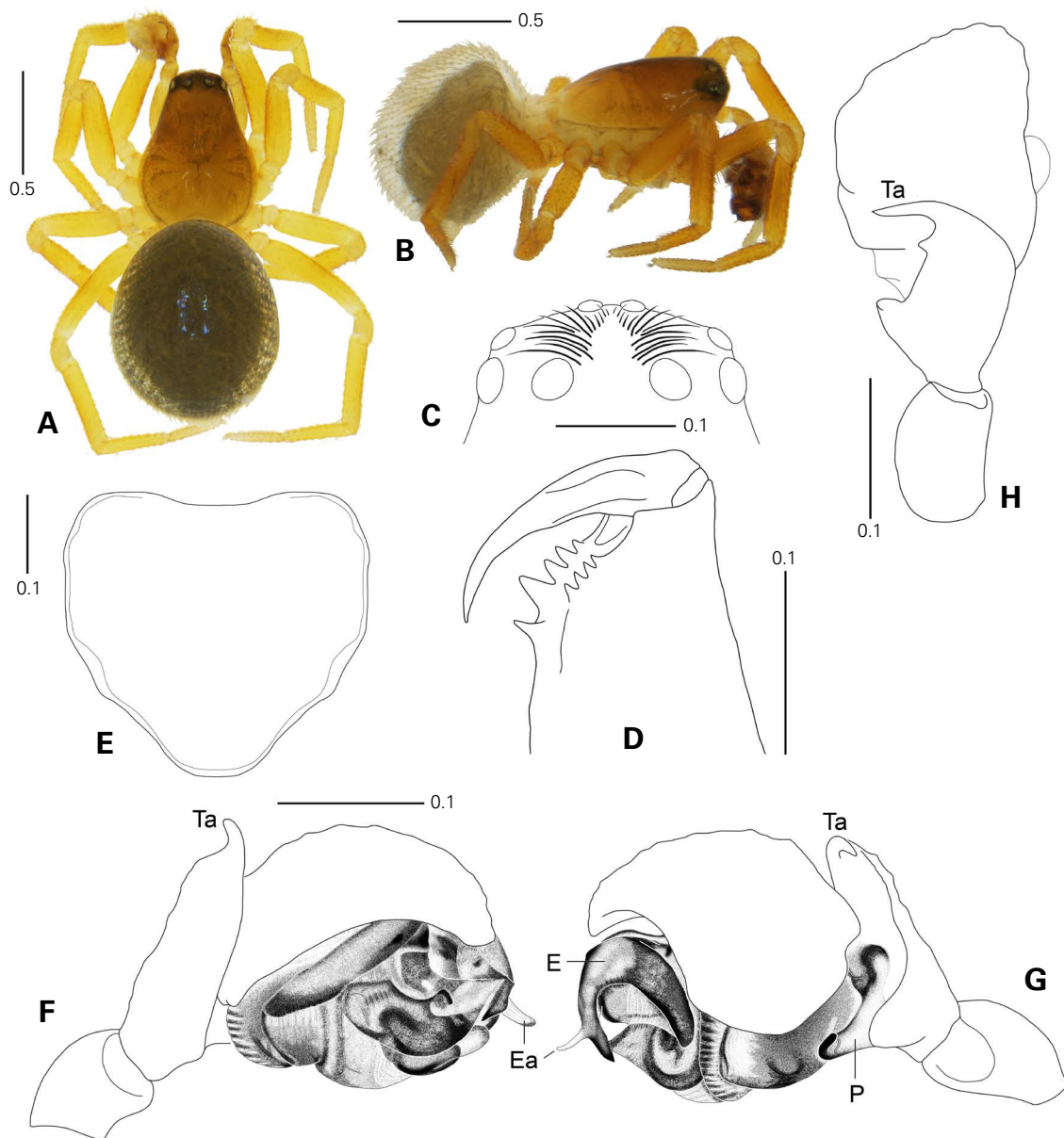
숲털애접시거미 (신칭) (Figs. 1, 2)

*Saitonia kawaguchikonis* Saito & Ono, 2001: 39, f. 81–85; Ono, Matsuda & Saito, 2009: 278, f. 249–252.

**Materials examined.** One male, 07 September 2018, Mt. Naejangsan National Park, Geumweol-ri, Bokheung-myeon, Sunchnag-gun, Jeollanam-do (35°25'19"N, 126°54'08"E, alt. 471 m); one male, 24 September 2018, Mt. Naejangsan National Park, Sinseong-ri, Bukha-myeon, Jangseong-gun, Jeollanam-do (35°25'39"N, 126°50'38"E, alt. 116 m); one male, 19 September 2019, Hallyeohaesang National Park, Hakdong-ri, Dongbu-myeon, Geoje-si, Gyeongsangnam-do (34°46'34"N, 128°39'26"E, alt. 60 m); one male, 27 June 2020, Mt. Naejangsan National Park, Sinseong-ri, Bukha-myeon, Jangseong-gun, Jeollanam-do (35°27'29"N, 126°50'28.0"E, alt. 154 m), leg. S.T. Kim and S.Y. Lee.

**Measurements** (in mm) Total length 1.52 (habitus). Carapace 0.75 long/0.54 wide. AER 0.22/PER 0.24. Chelicera 0.29 long/0.12 wide. Endite 0.10 long/0.12 wide. Labium 0.06 long/0.11 wide. Sternum 0.40 long/0.38 wide. Legs; I 1.50 (0.42, 0.14, 0.38, 0.30, 0.26), II 1.27 (0.41, 0.14, 0.30, 0.22, 0.20), III 1.17 (0.36, 0.12, 0.26, 0.22, 0.21), IV 1.51 (0.46, 0.15, 0.40, 0.29, 0.21). Palpus 0.94 (0.22, 0.09, 0.20, –, 0.22). Abdomen 0.80 long/0.70 wide.

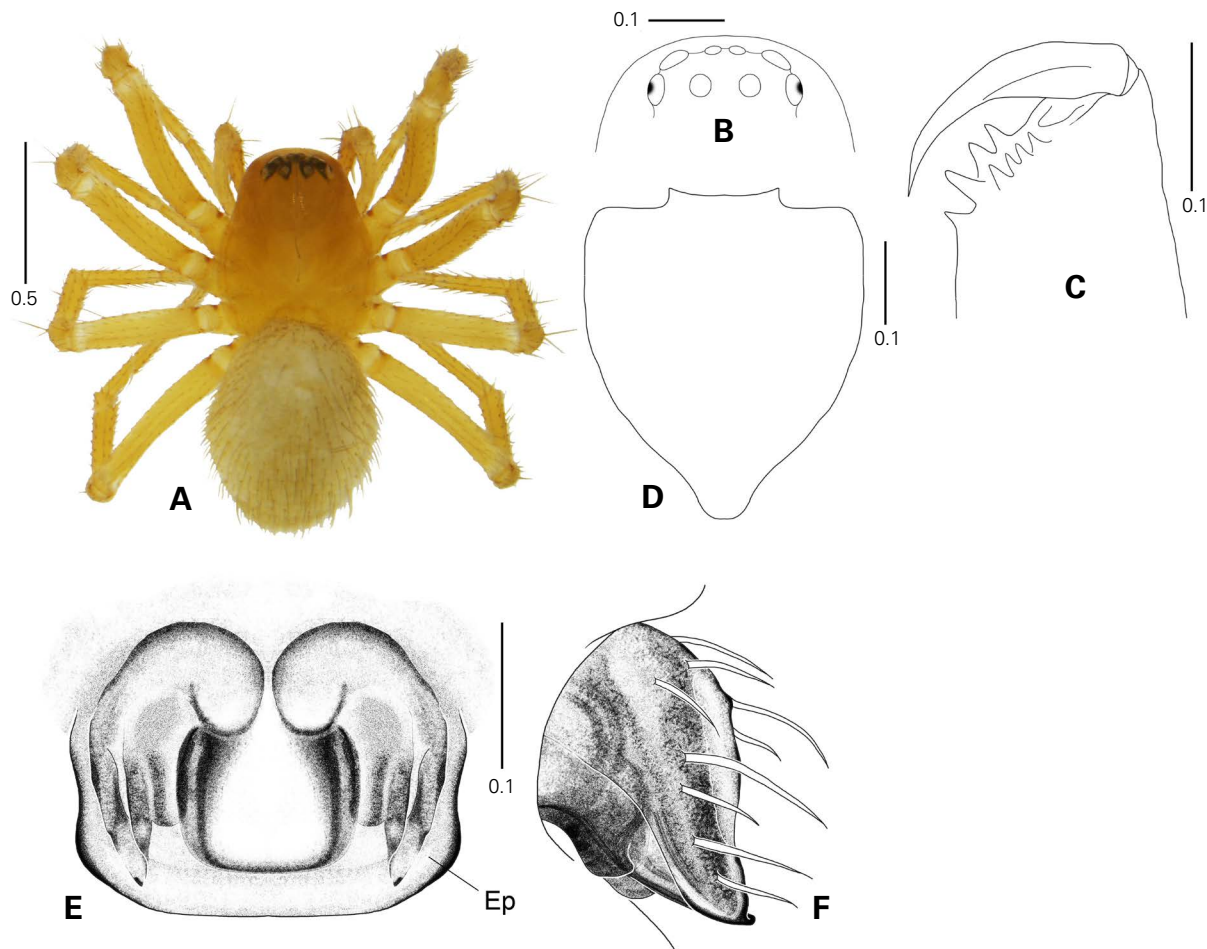
**Description.** Male. Carapace: dusky and pale reddish



**Fig. 2.** *Saitonia kawaguchikonis* Saito & Ono, 2001, male: A. Habitus in the dorsal view; B. Habitus in the lateral view; C. Eye area from above; D. Chelicera in the retrolateral view; E. Sternum; F. Palp in the prolateral view; G. Ditto in the retrolateral view; H. Ditto in the dorsal view (E, embolus; Ea, embolic apophysis; P, paracymbium; Ta, tibial apophysis). Scale bars in mm.

brown, pyriform, longer than wide, cervical and radial furrows distinct, longitudinal fovea short and needle-shaped, anterolateral edge of head region rather angular, no sulci (Fig. 2A), gently sloped (Fig. 2B). Eyes: all eyes encircled with black, eight eyes in two rows, AER slightly recurved and PER almost straight from above, clothed sparsely with pale and semi-transparent long hairs between AMEs and PMEs (Fig. 2C), AER slightly shorter than PER. Chelicera:

dusky and pale blackish brown with 4 prominent promarginal teeth and 5 retromarginal teeth (Fig. 2D). Endite: dusky and pale blackish brown. Labium: pale blackish gray. Sternum: blackish brown, subcordate, subequal in length and width, anteromedian end slightly depressed, posterior end round and protrudent between the coxae of leg IV (Fig. 2E). Legs: uniform yellow or reddish brown, thick and strongly developed, no annuli, slender and very long



**Fig. 3.** *Asthenargus niphonius* Saito & Ono, 2001, female: A. Habitus in the dorsal view; B. Eye area from above; C. Chelicera in the retrolateral view; D. Sternum; E. Epigyne in the ventral view; F. Ditto in the lateral view (Ep, epigynal plate). Scale bars in mm.

(Fig. 2A, B), leg formula IV ≐ I–II–III. Abdomen: blackish brown, ovoid, longer than wide, no patterns, clothed densely with short hairs (Fig. 2A, B). Palp: praeymbium with broad base and narrow blunt tip; thick embolus with 2 pointed apophyses curved like a loop (Fig. 2F, G); tibia projected dorsoapically bearing 2 large and small pointed apophyses (large one gently curved and hook-like) (Fig. 2H).

**Distribution.** Korea (New record), China, Japan.

**Remarks.** The species was collected with pitfall traps in leaf litter of mixed forests in hilly and mountainous terrain.

**Genus *Asthenargus* Simon & Fage, 1922**

네모잡시거미속 (신칭)

Type species: *Gongylidellum paganus* Simon, 1884.

**Diagnosis.** For detailed diagnosis and description, see Simon & Fage (1922) and Holm (1962).

***Asthenargus niphonius* Saito & Ono, 2001**

네모잡시거미 (신칭) (Figs. 1, 3)

*Asthenargus niphonius* Saito & Ono, 2001: 48, f. 100–103; Ono, Matsuda & Saito, 2009: 294, f. 496–499.

**Material examined.** One female, 17 August 2019, Mt. Sobeaksan National Park, Samga-ro, Punggi-eup, Yeongju-si, Gyeongsangbuk-do (36°55'41.2"N, 128°30'06.4"E, alt. 471 m), leg. S.T. Kim and S.Y. Lee.

**Measurements** (in mm) Total length 1.30 (habitus). Carapace 0.62 long/0.55 wide. AER 0.22/PER 0.26. Chelicera 0.38 long/0.18 wide. Endite 0.11 long/0.12 wide. Labium

0.05 long/0.13 wide. Sternum 0.41 long/0.38 wide. Legs; I 2.03 (0.57, 0.20, 0.49, 0.43, 0.34), II 1.88 (0.54, 0.20, 0.45, 0.38, 0.31), III 1.53 (0.46, 0.16, 0.30, 0.35, 0.26), IV 2.03 (0.61, 0.18, 0.49, 0.44, 0.31). Palp 0.96 (0.25, 0.06, 0.11, – , 0.24). Abdomen 0.70 long/0.60 wide. Epigyne 0.19 long/0.21 wide.

**Description.** Female. Carapace: yellowish brown, ovoid, longer than wide, cervical and radial furrows distinct, fovea indistinct, head region slightly elevated, head region darker than thoracic region (Fig. 3A). Eyes: all eyes encircled with black, eight eyes in two rows, AER slightly recurved and PER almost straight from above (Fig. 3B), AER shorter than PER. Chelicera: yellowish brown with 4 prominent promarginal teeth and 4 retromarginal teeth (Fig. 3C). Endite: pale yellowish brown, anterior edge truncated and anterolateral edge angular. Labium: pale yellowish brown. Sternum; pale yellowish brown, subcordate, longer than wide, anteromedian end slightly depressed, posterior end blunt and protrudent deeply between the coxae of leg IV (Fig. 3D). Legs: pale yellowish brown, slender but strongly developed, no annuli (Fig. 3A), leg formula  $IV \cong I-II-III$ . Abdomen: pale yellowish brown, ovoid, longer than wide, no patterns, clothed densely with long hairs (Fig. 3A). Epigyne: slightly wider than long; epigynal plate rectangular and highly sclerotized, distal end of the plate slightly twisted, center of the plate slightly depressed in a square; clothed sparsely with thick and long hairs (Fig. 3E, F).

**Distribution.** Korea (New record), Japan.

**Remarks.** The species was collected with pitfall traps in leaf litter of mixed forests in mountainous terrain.

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