Four species of the phytoseiid mites from Cheju Island in Korea (Acari, Phytoseiidae)

제주도산 이리응애 4종(응애아강, 이리응애과)

Myon-Ok RYU
류 멜옥

ABSTRACT Amblyseius (Amblyseius) barkeri, A. (A.) womersleyi, A. (A.) eharai, and Phytoseius (Pennaiseius) hongkongensis are recorded from the Cheju Island for the first time. A. (A.) barkeri and P. (P.) hongkongensis, previously unrecorded in Korea, are redescribed based on specimens from this island. The subgenus Pennaiseius is recorded for the first time in this country.

KEY WORDS Acari, Amblyseius (Amblyseius) barkeri, A. (A.) eharai, A. (A.) womersleyi, Cheju Is., Korea, New locality species, Phytoseiidae, Phytoseius (Pennaiseius) hongkongensis


검색어 간꼬리이리응애, 건털이리응애, 나팔이리응애, 제주도, 이리응애과, 응애아강, 한국이기록종, 홍콩이리응애

INTRODUCTION

Phytoseiid mites are predators of plant feeding mites. Therefore, many phytoseiids are used as biological control agents in a number of agricultural ecosystem. Up to the present, 36 species of phytoseiid mites have been recorded in Korea. But, the phytoseiids are little known from Cheju Island. In this paper, 4 species of the phytoseiid mites are recorded from this island for the first time; Amblyseius (Amblyseius) barkeri, A. (A.) womersleyi, A. (A.) eharai, and Phytoseius (Pennaiseius) hongkongensis. Among them, 2 newly recorded Korean species, A. (A.) barkeri and P. (P.) hongkongensis are redescribed based on specimens from Cheju Island. The subgenus Pennaiseius belonging to the genus Phytoseius is recorded for the first time in Korea. The genus Phytoseius has 2 subgenera, Phytoseius Ribaga, 1904 and Pennaiseius Pritchard et Baker, 1962. The females of the subgenus Pennaiseius are characterized by seta R1 present on the interscutal membrane, whereas those of the subgenus Phytoseius are characterized by seta R1 absent.

MATERIALS AND METHODS

The materials were collected with leaves of 6 plant species in the Cheju Island from 1994 to 1995. The specimens were kept in 70% alcohol and mounted on slides with Down's (1943) PVA solution. The setal nomenclature was based on that of Rowell et al. (1978). All measurements are given in micrometers.

DESCRIPTION

Amblyseius (Amblyseius) barkeri (Hughes)
나팔이리응애 (신청)

Faculty of Biological Sciences, Chonbuk National University, Chonbuk, Chonju 561-756, Korea (전북대학교 생물과학부)
Neoseiulus barkeri, Hughes, 1948, p. 141, Figs. 200-206; Ragusa and Athias-Henriot, 1983, p. 659, Fig. 8.
Typhlodromus (Neoseiulus) barkeri: Nesbitt, 1951, p. 35, pl. 12, Figs. 31, 33; Ehara, 1966, p. 18.
Typhlodromus (Typhlodromus) barkeri: Chant, 1959, p. 61, Figs. 72, 73.
Amblyseius barkeri: 124-126; Athias-Henriot, 1966, p. 215, Figs. 24, 32, 129; Tuovinen, 1993, p. 107, Fig. 25.

**Female.** Dorsal shield smooth; 347 long, 199 wide. Setae on dorsal shield: Z5 the longest, barbs; Z4 longer than s4; remaining setae much shorter, smooth. Sternal shield with posterior margin concave, with 3 pairs of setae; metasternal platelets longer than wide. Ventrianal shield much longer than wide, wider than genital shield; 3 pairs of preanal setae; a pair of crescentic pores almost between and slightly behind setae JV2. Setae JV5 smooth. Two pairs of slender metapodal platelets. Spermatheca as figured (Figs. 4-5). Peritreme not extending to seta j1; peritrematal shield fused anteriorly with dorsal shield. Chaetotaxic formula; genu II, 2-2/0, 2/0-1, genu III, 1-2/1, 2/0-1. Basitarsus IV with 1 macroseta. Lengths of setae (n = 2): j1 17.7, j3 25.2, j4 19.3, j5 18.5, j6 19.3, J2 24.8, J5 15.1, z2 24.8, z4 24.4, z5 17.2, Z1 27.3, Z4 39.9, Z5 55.9, s4 32.4, S2 30.3, S4 28.2, S5 21.0, r3 25.6, R1 22.3, JV5 50.0, macrosetae on basitarsus IV 65.1.

**Male.** Not known

**Material examined.** One ♀, Samyangdong, Chejushi, Cheju Is., 4-IX-1995, on Cucumis sativus L. (K. S. Lee leg.); 1 ♀, Yusuwonri, Hanlim, Cheju Is., 5-IX-1995, on Cucumis sativus L. (K. S. Lee leg.).

**Distribution.** Korea, Africa, China, England, Europe, Israel, Japan, Turkey, Ukraine.

**Remark.** According to Mr. Lee's observation, A. (A.) barkeri feeds on thrips on Cucumis sativus L. This

Figs. 1-6. Amblyseius (Amblyseius) barkeri (♀). 1, Dorsum of idiosoma; 2, Sternal shield; 3, Ventrianal shield; 4-5, Spermatheca; 6, Genu, tibia and basitarsus of leg IV. (Scales: 1,2,3,6=50 μm; 4,5=20 μm).
species is found usually indoors in Japan. (Ehara, 1972). A. (A.) barkeri has a haploid number of 4 and a diploid number of 8 chromosomes, and is arrhenotokous (Wysoki, 1973).

_Amblyseius (Amblyseius) eharai_ Amitai et Swirski

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_Amblyseius eharai_ Amitai et Swirski, 1981, p. 60, Figs. 1-3, 6-8, 12-13; Ryu, 1996, p. 60.

_Amblyseius (Amblyseius) eharai_: Ryu, 1993, 101, Figs. 35-44.

_Amblyseius deleoni_ (nec Muma et Denmark): Lee and Ryu, 1989, p. 216, Fig. 1A-H.

This species is recorded for the first time from Cheju Island.


_Distribution_. Korea, China, Japan, Taiwan.

_Amblyseius (Amblyseius) womersleyi_ Schicha

긴털이리응애


_Amblyseius longispinosus_ (nec Evans): Lee and Ryu, 1989, p. 219, Fig. 3A-G; Ryu and Ehara, 1990, p. 148, Fig. 13.

_Amblyseius (Amblyseius) longispinosus_ (nec Evans): Ryu, 1993, p. 95, Figs. 3-10.

This species is recorded for the first time from Cheju Island.

Specimens examined. One ♀, Chungmun, Cheju Is., 10-VIII-1994, on Ficus carica L. (M. O. Ryu leg.); 1 ♂, Samyangdong, Cheju, Cheju Is., 4-IX-1995, on Solanum tuberosum L. (K. S. Lee leg.).

_Distribution_. Korea, Australia, China, Japan, Taiwan.

_Phylloseius (Phytoseius) hongkongensis_

Swirski et Shechter

홍콩이리응애 (신청)

(Figs. 7-15)

_Phylloseius (Phytoseius) hongkongensis_ Swirski et Shechter, 1961, p. 99, Figs. 1-5; Amitai and Swirski, 1966, p. 19, Fig. 2; Denmark, 1966, p. 44, Fig. 17.

_Phylloseius (Phytoseius) hongkongensis_: Ehara, 1966, p. 25; Ehara and Lee, 1971, p. 70, Figs. 32-37; Ehara, 1972, p. 169, Fig. 81; Ehara, Okada and Kato, 1994, p. 145.

_Female_. Dorsal shield lightly reticulated laterally; 272 long, 144 wide; 3 pairs of conspicuous solenostomes. Setae on dorsal shield: j1, j3, z2, z3, Z4, Z5, s4, s6 and r3 serrate; the remaining setae shorter, smooth; s4 the longest; j3 as long as Z4 and Z5, slightly shorter than s6; z3 as long as r3, longer than j1; R1 on interscutal membrane, smooth. Sternal shield with posterior margin with indentation, with 3 pairs of setae; metasternal platelets longer than wide. Ventrianal shield much longer than wide, with lateral margins strongly concave, slightly narrower than genital shield; 3 pairs of preanal setae; a pair of small preanal pores caudal to posterior pair of preanalans (JV2). Seta JV5 stout, serrate. A pair of slender metapodal platelets. Spermatheca as figured (Fig. 10). Fixed digit of chelicera with 3 teeth, with pilus dentilis; movable digit with 2 teeth. Peritreme not extending to seta j1; peritrematal shield fused anteriorly with dorsal shield. Chaetotactic formula; genu II 2-2/0, 2/0-1, genu III 1-2/0, 2/0-1. Leg IV with 4 macrosetae, genu, tibia, basitarsus and telotarsus; apex of genual and tibial macroseta with a lateral notch. Lengths of setae (n=10, Mean±S.E.): j1 28.4±0.4, j3 64.6±0.7, j4 60.0±0.1, j5 6.2±0.1, j6 6.9±0.2, j2 9.6±0.3, j5 7.4±0.2, z2 18.2±0.4, z3 44.8±0.7, z4 12.8±0.9, z5 6.0±0.1, Z4 67.7±0.9, Z5 68.8±0.8, s4 88.5±0.9, s6 75.2±0.7, r3 42.6±0.6, R1 16.2±0.4, JV5 49.0±0.6, macrosetae on leg IV: genu 25.6±0.3, tibia 29.4±0.5, basitarsus 28.4±0.3, telotarsus 30.8±0.5.

_Male_. Dorsal shield reticulated laterally; 223 long, 132 wide; at least 4 pairs of small pores. Seta R1 dorsal shield. Peritreme extending to seta z2 level. Ventrianal shield not fused with peritrematal shield, 3 pairs of preanal setae; a pair of small preanal pores. Fixed di-
Fig. 7-15. *Phytoseius* (*Pennaseius*) *hongkongensis* 7, Dorsum of idiosoma (♀); 8, Sternal shield (♀); 9, Posterior of ventral surface (♀); 10, Spermatheca; 11, Chelicera (♀); 12, Tarsus, tibia and genu of leg IV (♀); 13, Dorsum of idiosoma (♂); 14, Chelicera (♂); 15, Ventrianal shield (♂). (Scales: 7,8,9,12,13,15=50 μm; 10,11,14=20 μm).

igit of chelicera with 3 teeth, the movable digit unidentate; spermatoactyl as figured (Fig. 14). Leg IV with 4 macrosetae, genu, tibia, basitarsus and telotarsus; apex of genual and tibial macroseta with a lateral notch. Lengths of setae (n = 1): j1 20.2, j2 48.7, j4 5.9, j5 5.9, j6 6.7, j2 9.2, j5 6.7, z2 14.3, z3 34.4, z4 9.2, z5 5.0, Z4 43.7, Z5 35.3, s4 61.3, s6 46.2, r3 31.9, R1 12.6, JV5 21.0, macrosetae on leg IV: genu 18.5, tibia 21.0, baistarsus 26.9, telotarsus 27.7.

**Specimens examined.** Ten ♀♀ & 1 ♂, Sogwipo, Cheju Is., 10-VIII-1994, on *Broussonetia papyrifera* (L.) Vent. (M. O. Ryu leg.).

**Distribution.** Korea, China, Japan, Madagascar, Papua New Guinea, Taiwan, Thailand.

**Remark.** Korean specimens of the female of *P. (P.) hongkongensis* slightly differ from Hong Kong specimens of that (Ehara and Lee, 1971) in having macroseta of genu IV as long as that of basitarsus IV and telotarsus IV,
and seta s6 slightly longer than Z5. This species generally inhabit the subtropical and the tropical zone.

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REFERENCES


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