A new record of phytoseiid mite, *Neoseiulus harrowi* Collyer, 1964 (Acari: Mesostigmata) from Republic of Korea

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During a study of acarine biodiversity, a phytoseiid mite was collected from soil samples under the rose of Sharon plants. The specimen was identified as *Neoseiulus harrowi* Collyer, 1964, which was previously only reported in New Zealand and Australia, and is thus a new record for Korean phytoseiid fauna. *Neoseiulus harrowi* is morphologically similar to *N. makuwa* (Ehara), but distinctly different in two characters: shorter length of two posterior setae (Z4, Z5) and a forked atrium of spermatheca longer in *N. makuwa* than in *N. harrowi* in females.

Keywords: Bioblitz, biological control, hibiscus, *Neoseiulus harrowi*, Seoul metropolitan

INTRODUCTION

Mites in the family Phytoseiidae are primarily feed on smaller arthropods or plant pollen in broad habitats ranging from the ground and aerial habitats (Walter and Lindquist, 1997; Lindquist et al., 2009). The family Phytoseiidae is species rich with approximately 1,800-plus described species, which represents approximately 15% of the known diversity of the Mesostigmata (Kostianen and Hoy, 1996). Although species that specialize on spider mites (e.g., *Phytoseiulus*, *Galendromus*, and some *Neoseiulus*) are best known, most phytoseiids are polyphagous and feed on a variety of small arthropods, including pestiferous thrips, whiteflies, scale crawlers and eriophyoid mites or plant parts such as pollen, honeydew, plant exudates or leaf cell contents, and to a certain extent, fungi (McMurtry and Croft, 1997; Zemek and Prenerova, 1997). Thus, many phytoseiids are used as biocontrol agents of agricultural pests (Beard, 2001). Phytoseiids also are known to be common inhabitants of leaf domatia (Walter, 1996). A few species are found in soil (e.g., some *Neoseiulus*, *Proprioseiopsis*, and *Amblyseius*) or in animal nests (usually species of *Neoseiulus*).


Currently, 51 species of phytoseiid mites, in 10 genera, have been recorded in Republic of Korea. Within the Phytoseiidae, the genus *Neoseiulus* is represented by six species (NIBR, 2013). Here, we provide a description of one new record of the species *N. harrowi* relative to the original description and we compare the species morphometrically to a closely related species, *N. makuwa* (Ehara, 1972).

MATERIALS AND METHODS

We collected soil from an urban forest in Seoul, Republic of Korea, and analyzed as per the previous study done for soil gamasina mites biodiversity in Korea by Keum and Jung (2014). Soil microarthropods were extracted using a modified Berless-Tullgren funnel (30W, 72h), preserved in 70% ethyl alcohol and mounted on glass slides using polyvinyl alcohol mounting medium (PVA medium) (Downs, 1943). Morphological features of adult female mites and setal measurements were conducted under the compound Olympus JP/BX51 phase contrast microscope equipped with a drawing tube. Species that were a new record for Korea were deposited in the Insect Ecology Lab, Department of Plant Medicine, Andong National University (ANU), Andong, Korea and also in NIBR (ZIIYIV0000004875).
RESULTS AND DISCUSSION

Family Phytoseiidae Berlese, 1913
Subfamily Amblyseiinae Muma, 1961
Tribe Neoseiulini Chant and McMurtry, 2003

Genus Neoseiulus Hughes, 1948

Table 1. Setal measurements of Neoseiulus harrowi and N. makuwa

<table>
<thead>
<tr>
<th>Coding system of dorsal setae</th>
<th>N. harrowi (Collyer)</th>
<th>N. makuwa (Ehara)</th>
</tr>
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<tbody>
<tr>
<td>j1</td>
<td>D1</td>
<td>12.50</td>
</tr>
<tr>
<td>j3</td>
<td>L1</td>
<td>17.38</td>
</tr>
<tr>
<td>j4</td>
<td>D2</td>
<td>17.12</td>
</tr>
<tr>
<td>j5</td>
<td>D3</td>
<td>16.72</td>
</tr>
<tr>
<td>j6</td>
<td>D4</td>
<td>18.85</td>
</tr>
<tr>
<td>J2</td>
<td>D5</td>
<td>21.50</td>
</tr>
<tr>
<td>J5</td>
<td>D6</td>
<td>11.65</td>
</tr>
<tr>
<td>s4</td>
<td>L4</td>
<td>22.01</td>
</tr>
<tr>
<td>S2</td>
<td>L6</td>
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</tr>
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<td>L7</td>
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</tr>
<tr>
<td>S5</td>
<td>L8</td>
<td>20.37</td>
</tr>
<tr>
<td>z2</td>
<td>L2</td>
<td>18.53</td>
</tr>
<tr>
<td>z4</td>
<td>L3</td>
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<td>Z1</td>
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<tr>
<td>R1</td>
<td>S2</td>
<td>18.16</td>
</tr>
</tbody>
</table>

All measurements are in μm

Fig. 1. Neoseiulus harrowi Collyer, 1964 female (A) dorsal idiosoma; (B) ventral idiosoma.
TYPE SPECIES: *Neoseiulus barkeri* Hughes, 1948.

**Diagnosis.** The diagnosis of *Neoseiulus* used here is based on that of Hughes (1948) and following Ryu (2007).

*Neoseiulus harrowi* Collyer, 1964

**Specimens examined.** Thirty four females, Seoul Forest, Seoul, Republic of Korea, 37°32’ N, 127°02’ E. alt. 68 m, 10 Jun 2014, E. Keum coll., from soil of *Hibiscus syriacus*.

**Diagnosis.** Female. Body length 351-421 and width 208-277 μm. Dorsal shield smooth, with light anterolateral lineation; all dorsal setae short, thin, smooth; Z5 smooth, may have 1-2 small barbs. Sternal shield smooth. Ventrianal shield with pair small round pores, distance between pores 37-38. Fixed digit of chelicera with five or six teeth, two anterior and three or four posterior teeth; movable digit with one strong tooth and a bump, may be a second vestigial tooth. Calyx of spermathecal apparatus long, narrow, tubular, parallel-sided basally and arms diverging strongly distally to form V-shape (trumpet-shaped); atrium large, as broad as junction with major duct; major duct membranous, broad near atrium and...

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**Fig. 2.** (A) spermathecal and chelicera of *Neoseiulus harrowi* Collyer 1964 and (B) *N. makuwa* (Ehara, 1972).
Survey of Korean Indigenous Species” from the National Institute of Biological Resources (NIBR) of the Ministry of Environment (MOE) in Korea.

**REFERENCES**


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