

# First record of *Sanaa regalis* (Orthoptera, Tettigoniidae, Pseudophyllinae) from the central Himalayas

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## Abstract

A female individual of *Sanaa regalis* (Brunner von Wattenwyl, 1895) was collected in the Tanahun district of Central Nepal in September 2021. This katydid had been reported prior from India in the East Himalayas and Chhattisgarh in Central India. This is the first record of this species from the Central Himalayas, Nepal. The female of this species differs from its congeners *S. imperialis* (White, 1846) and *S. intermedia* Beier, 1944 in its ovipositor being distinctly black at the base.

## Keywords

grasshopper, katydid, Nepal, new distribution, new record, *Sanaa imperialis*, *Sanaa intermedia*

## Introduction

Nepal lies in the middle of the Himalayas, with the eastern end in the Eastern Himalayas near Sikkim, the western end in the Western Himalayas near Uttarakhand, and most of the country in the Central Himalayas. The study of the Tettigoniidae fauna of Nepal dates back to Walker (1869) when he described *Incertana concinna* (Walker, 1869), which was presented to him by Maj. Gen. Thomas Hardwicke. Later, Ragge (1961) reported *Ducetia japonica* (Thunberg, 1815) from Pokhara based on a male specimen collected in 1954. Beier (1962) cited *Sanaa imperialis* (White, 1846) from Nepal. Five more species were recorded by Chopard and Dreux (1966): *Conocephalus* (*Anisoptera*) *fuscus* (Fabricius, 1793), *Mecopoda elongata* (Linnaeus, 1758), *Himertula kinneari* (Uvarov, 1924), *Letana recticercis* Chopard & Dreux, 1966 and *Dreuxia incerta* Chopard & Dreux, 1966, followed by Bey-Bienko (1968) who added one more species i.e., *Macroteratura* (*Stenoteratura*) *janetscheki* (Bey-Bienko, 1968) from East Nepal. Following this, most of the studies have been done by Ingrisch (1987, 1990a, 1990b, 2001, 2002, 2006), Ingrisch and Garai (2001), and Ingrisch and Shishodia (1998). A few other species are listed in Liu and Xia (1992), Kevan and Jin (1993), Joshi and Manandhar (2001), Shishodia et al. (2010), and most recently

in Jin et al. (2020), describing *Macroteratura* (*Stenoteratura*) *twinslobo* Liu, 2020 based on a male holotype at Bishop Museum, Honolulu, USA collected in 1966 from Kathmandu. Joshi and Manandhar (2001) reported a genus named *Scuddria* (possibly a typo for *Scudderia* Stål, 1873) with limited evidence. *Scudderia* is a New World genus, and its occurrence in Nepal is very unlikely. The referred specimen (Orth. 69) may be somewhere in their collection, but there is doubt as to whether it is *Scudderia*. So far, the most recent comprehensive list of Tettigoniidae reported from Nepal is in Ingrisch (2006), with 45 fully identified species plus 6 species identified to genus level only. The Orthoptera Species File lists 40 species of Tettigoniidae recorded from Nepal (Cigliano et al. 2022). This list, however, omits several valid taxa included in Ingrisch (2006): *Conocephalus* (*Chloroxiphidion*) *laetus* (Redtenbacher, 1891), *Conocephalus* (*Anisoptera*) *fuscus* (Fabricius, 1793) (reported as *Conocephalus* (*Xiphidion*) *discolor*), *Conocephalus* (*Anisoptera*) *melaenus* (Haan, 1843), *Euconocephalus* *pallidus* (Redtenbacher, 1891), *Xiphidiopsis* (X.) *lita* Hebard, 1922, and *Holochlora japonica* Brunner von Wattenwyl, 1878. It also omits some taxa reported by Shishodia (2006, 2007) and Shishodia et al. (2010): *Orthelimaea securigera* (Brunner von Wattenwyl, 1878), *Sanaa imperialis* (originally reported by Beier 1962), and *Tegra viridivitta* (Walker, 1870), and two more by Joshi and Manandhar (2001): *Isopsera pedunculata* Brunner von Wattenwyl, 1878 and *Phaneroptera* (*Phaneroptera*) *myllocerca* Ragge, 1956. The last two reported by Joshi and Manandhar (2001) were also omitted by Ingrisch (2006), but Ingrisch (2006) never referenced the aforementioned literature. After examination of the relevant literature, the number of Tettigoniidae recorded from Nepal seems to be around 55. That being said, an updated checklist is required.

*Sanaa regalis* is a colorful katydid described originally from Sikkim and later reported from Darjeeling, Assam, Nagaland, West Bengal, and Arunachal Pradesh in the East Himalayas (Ingrisch 2002, Barman 2003, Gogoi et al. 2015) and Raipur, Chhattisgarh in Central India (Gupta and Chandra 2018). It can be recognized by the four large greenish yellow maculae on its brown tegmina. There are several black blemishes on the brown part of the tegmina, and numerous bluish streaks on a black background

on the hindwings. The hindwings are spotted anteriorly. The pronotum is greenish yellow, and the rest of the body is mostly black with tinges of brown in some parts. The subgenital plate of the male is black, while the ovipositor of the female is black at its base (Beier 1962, Barman 2003, Cigliano et al. 2022).

Here, we report the first record of this species from the Central Himalayas in Nepal.

### Methods

The individual was seen by the first author as a chance encounter on a rural road in Shuklagandaki Municipality in the Tanahun district of Central Nepal (Fig. 7). In the field, this unique-looking Tettigoniidae could only be identified as a female Pseudophyllinae. The individual was handpicked, stored in a perforated vial,

and brought to Pokhara alive for further study. Photographs of the live individual were then taken (Figs 1, 2) using a Canon 7D mark II with 100 mm f/2.8L Macro IS USM lens. For further identification, the individual was euthanized using ethyl acetate, and the specimen was taken to Agriculture and Forestry University (AFU), Chitwan. It was pinned and spread, and photographs of different parts were taken (Figs 3–6) with the same setup as above. The location and altitude of the collection locality were determined using Google Maps, and a map of the study area was created using ArcMap 10.4. The specimen is deposited at Annapurna Natural History Museum, Pokhara.

Identification was done using Beier (1962), Barman (2003), and the Orthoptera Species File (Cigliano et al. 2022). The identification was confirmed by Dr. Sigfrid Ingrisch (Research Museum Alexander Koenig, Germany).



Fig. 1. Female individual of *S. regalis* from Tanahun. Photograph taken in Pokhara on 21 Sept. 2021 on a *Tagetes* L. plant.



Fig. 2. Female individual of *S. regalis* from Tanahun showing the front and ventral sides of the head.





Fig. 3. Habitus (dorsal). Apices of tegmina lost due to improper handling; refer to Fig. 1.



Fig. 4. Habitus (ventral).



Fig. 5. Ovipositor of the female *S. regalis* showing its distinctly black base.



Fig. 6. Habitus (lateral).





Fig. 7. Map of Nepal showing the discovery area.

## Results

### Taxonomy

Family Tettigoniidae Krauss, 1902  
 Subfamily Pseudophyllinae Burmeister, 1838  
 Supertribe Pseudophylliti Burmeister, 1838  
 Tribe Cymatomerini Brunner von Wattenwyl, 1895

Genus *Sanaa* Walker, 1870

Type species.—*Sanaa regalis* (Brunner von Wattenwyl, 1895)

**Comparison with congeners.**—There are two other species of *Sanaa*, both reported from the Indomalaya region: *S. intermedia* Beier, 1944, originally reported from Than-Moi, Vietnam, and *S. imperialis* (White, 1846), originally reported from Sylhet, Bangladesh (Orthoptera Species File Version 5.0/5.0). The latter species, however, is also recorded from Nepal (Beier 1962). The female of *S. regalis* differs from that of *S. imperialis* mainly in having its ovipositor black at the base, while the ovipositor of *S. imperialis* is yellow (Barman 2003). Similarly, the ovipositor of *S. intermedia* is yellow-brown at the base (Beier 1962).

**Material examined.**—NEPAL • 1♀; Mandery, Shuklagandaki, Tanahun, Gandaki Province, 28°02'27"N, 84°01'30"E, 570 m a.s.l.; 20 Sept. 2021; Coll. Sajjan K.C.

**Previously known distribution.**—India: Sikkim, Darjeeling, Assam, Nagaland, Arunachal Pradesh, West Bengal, Chhattisgarh

**Habitat and ecology.**—The individual was observed on a rural road near bushes in the mid hills of central Nepal at 15:00 hours (+5.46 GMT) on a clear day. The elevation was 570 m a.s.l. Dominant local tree species include *Castanopsis indica* (J. Roxb. ex Lindl.) A. DC. and *Schima wallichii* (DC.) Korth. along with the bushes of *Rubus ellipticus* Sm.

### Discussion

Studies of the Orthoptera of Nepal have been scarce in recent years, and it is not surprising to find a species in Nepal that had only ever been reported from neighboring countries. *Sanaa regalis* is probably also found in East Nepal, as well as at higher or lower altitudes, since it has been reported at higher (Sikkim, Darjeeling, Arunachal Pradesh, Nagaland) and lower (Assam, West Bengal, Chhattisgarh) altitudes in the East Himalayas and Central India.

Further research could significantly extend the knowledge on the Tettigoniidae of Nepal.

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