

# New regional records of true grasshoppers (Orthoptera, Tettigoniidae) from the Càn Giò mangrove reserve in southern Vietnam

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## Abstract

Three species of true grasshoppers, *Sathrophyllia rugosa* (Linnaeus, 1758), *Mecopoda fallax* He, 2019 and *Mecopoda elongata* (Linnaeus, 1758) (Orthoptera, Tettigoniidae), have been discovered in the Càn Giò Mangrove Biosphere Reserve, a protected area in southern Vietnam dominated by marine ecosystems and mangrove forests. These species have never been previously recorded in the reserve or southern Vietnam. If widely distributed *M. fallax* and *M. elongata* has been indicated for the territory of Vietnam, including through citizen science observations (GBIF), then *S. rugosa* is recorded in the territory of Vietnam for the first time.

**key words:** New records, insect, Orthoptera, *Sathrophyllia rugosa*, *Mecopoda fallax*, *Mecopoda elongata*, biodiversity, forest ecosystems, Vietnam, SE Asia.

## 1. Introduction

True grasshoppers from the family Tettigoniidae, also known as katydids or bush crickets, are widely distributed cosmopolitan insects, which prevalent in tropical and subtropical habitats (Gwynne 2001; Riffat and Wagan 2012; Eades et al. 2016). The fossilized remains of tettigoniid subfamilies have been discovered since the Paleogene time (Gorochoy, 2010; Nel et al., 2008; Théobald, 1937). Currently, about 7,000 species in nearly 1200 genera divided into 20 subfamilies are known. These insects can be diurnal or nocturnal, and they produce strident mating sounds. Some species also exhibit mimicry and camouflage, resembling plants or lichens in appearance and color. (Johannesson and Ekendahl, 2002; Ruxton et al., 2004; Svanbäck and Eklöv, 2011).

The genus *Sathrophyllia* Stål, 1874 (Pseudophyllinae) currently includes eight species namely *Sathrophyllia femorata* (Fabricius, 1787), *Sathrophyllia torrida* (Stål, 1874), *Sathrophyllia marmorata* (Stål, 1874), *Sathrophyllia fuliginosa* (Stål, 1874), *Sathrophyllia rugosa* (Linnaeus, 1758), *Sathrophyllia cornuta* (Thunberg, 1815), *Sathrophyllia saeedi*

Sultana, Panhwar, Wagan and Khatri, 2014 and *Sathrophyllia irshadi* Sultana, Panhwar, Wagan and Khatri, 2014, which are mostly characterized by the rugose shape of the tegmina (Kirby, 1906; Barman, 2003; Sultana et al., 2014). The genus is widely distributed in the Oriental region from India to Nepal and Southeastern Asia, Java and Sumatra, but has never been recorded in Vietnam.

The genus *Mecopoda* Serville, 1831 (Mecopodinae) currently contains numerous described taxa of the species and subspecies levels, is widely distributed in Indo-Malayan and Papuan Regions as well as reaching Australia (e.g., Gorochov, 2020). Three species of the genus are known from Vietnam, namely *M. ampla* Gorochov, 2020, *M. prominens*, *M. fallax* He, 2019 (Vinh Phu, Hoa Binh and Gia Lai Provinces) and *M. elongata maculata* Audinet-Serville, 1831 (without exact locality in Vietnam) (Gorochov, 2020) and *M. niponensis vietnamica* Heller and Korsunovskaya, 2021 (Heller et al., 2021).

The C n Gi r Mangrove Reserve in southern Vietnam was designated as a World Biosphere Reserve by UNESCO in January 2000. The forested area of the reserve is 31.773 hectares (ha), with 60% of this area being planted forests and 40% being natural forests, primarily consisting of the monoculture of the mangrove tree of the tall-stilt mangrove tree *Rhizophora apiculata* Bl. (Rhizophoraceae). Since 2002, the reserve has participated in the international program to conserve the biological diversity of birds and other animal species (UNESCO/MAB, 2000; Tuan et al., 2002; Tuan and Kuenzer, 2012). The fauna of the reserve, particularly in terms of insects (Insecta), has been poorly studied, since the reserve mainly consist of marine ecosystems. However, there are small patches of typical monsoon forest within the territory of this reserve that harbor a fairly diverse fauna, including a variety of true grasshoppers. The purpose of this study is to provide new faunal data on true grasshoppers in the reserve, which also allows for a better understanding of the biological diversity of their diversity in the fauna of South Vietnam.

## 2. Materials and methods

Sampling was conducted at night using a light trap (two high-pressure mercury lamps, TGM DRL 250) in the area of mangrove swamps, which are mainly overgrown with monocultural forests of the tall-stilt mangrove tree *R. apiculata* in the C n Gi r Mangrove Biosphere Reserve, Ho Chi Minh City, Vietnam. The sampling took place in September (the wet season) of 2024. The collected grasshoppers were taken alive and photographed using a Canon G16 digital camera, then dried. Afterwards, they were dried and pinned. Identification of the species was done using the Orthoptera Species File (Cigliano et al. 2020), the Synonymic Catalogue of Orthoptera (Kirby, 1906) and Gorochov (2020).

The material is deposited in the first author’s collection at the A.N. Severtsov Institute of Ecology and Evolution of Russian Academy of Sciences, Moscow, Russia (LEMMI) and Laboratory of Hydrobiology of the Southern Branch of the Joint Vietnam–Russia Tropical Research and Technological Center, Ho Chi Minh, Vietnam (LH VRTRTC).

## 3. Taxonomic account

Order Orthoptera Hebard, 1924  
Suborder Ensifera Chopard, 1920  
Superfamily Tettigonioidea Krauss, 1902  
Family Tettigoniidae Krauss, 1902  
Subfamily Pseudophyllinae Burmeister, 1838

Tribe Cymatomerini Brunner von Wattenwyl, 1895

Genus *Sathrophyllia* St l, 1874

*Sathrophyllia rugosa* (Linnaeus, 1758)

(Figure 1a-c)

*Material examined.* ♀ - VIETNAM, Ho Chi Minh City district, C n Gi  Mangrove Biosphere Reserve, 10°27'20.6"N 106°53'33.1"E, night sampling with a light trap, coll. I. Marin, R. Saifutdinov and E. Ablyazov, 27 September 2024.

*Diagnosis.* A large insect with ash-brown coloration (Fig. 1a), appearance rugose, longer antennae more than its body size. Pronotum with median, swollen, large crest presents at the basal part, with one sharp tooth and at posterior side multiple teeth at the anterior side. Tegmina convex and appeared shorter than wings, distinct dots, with 2 transverse sulci in center (Fig. 1a, b). The fore femur stout, with ventral margin and is strongly lamellate and with distinct lobe. The dorsal edge of mid femur faintly lamellar and mostly straight. Fore, mid and hind femur with rounded grooves at ventral side, all tibiae spotted. The supra-anal plate oval and little cut at apex. Ovipositor with bladelike toothed apex (Fig. 1b).

*Distribution.* This species is currently has been recorded in the East Himalaya, Nepal, India, Sri Lanka, Southeast China, Thailand, Java and Sumatra. This is the first record of the species in Vietnam and C n Gi  Mangrove Biosphere Reserve (Fig. 1d).

Subfamily Mecopodinae Walker, 1871

Tribe Mecopodini Walker, 1871

Genus *Mecopoda* Serville, 1831

*Mecopoda fallax* (Linnaeus, 1758)

(Figure 2a-c)

*Material examined.* ♂ - VIETNAM, Ho Chi Minh City district, C n Gi  Mangrove Biosphere Reserve, 10°27'20.6"N 106°53'33.1"E, night sampling with a light trap, coll. I. Marin, R. Saifutdinov and E. Ablyazov, 25 September 2024.

*Diagnosis.* Medium-sized to large-sized body, with camouflage coloration (Fig. 1a, c). Frontal rostrum with obvious transverse margin. Pronotum saddle shaped, disc narrowing distally and widening posteriorly, lateral carinae convex medial part, tympanum on both sides of fore tibiae with same size. The length of abdomen no longer than half of forewing. Forewings long, tegmina narrow (about 3.5X as long as wide), parallel in lateral view, without mirror; hindwing little longer than forewing (Fig. 1c). Tegminal stridulatory apparatus in males rather long, the mirror distal concavity of the male right tegmen narrow, area between the distal part of the over-mirror fold lateral edge and the anal tegminal edge in this tegmen not very widened. Ovipositor straight.

*Distribution.* This species has been recorded is Thailand, Southeast China and Malaysia. In Vietnam, the species previously has been recorded from Vinh Phu, Hoa Binh and Gia Lai Provinces (see Gorochoy, 2020). This is the first record of the species in the C n Gi  Mangrove Biosphere Reserve (Ho Chi Minh City area), southern Vietnam.

*Mecopoda elongata* (Linnaeus, 1758)

(Figure 2d-i)

*Material examined.* ♀ and ♂ - VIETNAM, Ho Chi Minh City district, C n Gi  Mangrove Biosphere Reserve, 10°27'20.6"N 106°53'33.1"E, night sampling with a light trap, coll. I. Marin, R. Saifutdinov and E. Ablyazov, 29 September 2024.

*Diagnosis.* Medium-sized to large-sized body, with camouflage coloration (Fig. 1d). Wings long narrow in lateral view, tegmina narrow (4.5-5.0X as long as wide) (Fig. 1d, f). Tegminal stridulatory apparatus in males rather long, the mirror distal concavity of the male right tegmen narrow, area between the distal part of the over-mirror fold lateral edge and the anal tegminal edge in this tegmen not very widened (Fig. 1j).

**Distribution.** This species has been recorded in India, Sri-Lanka, Nepal, Myanmar, Thailand, Vietnam, Southeast China, Java, Malaysia, Philippines, Sulawesi Sumatra Solomon Is., Korea. In Vietnam, the species previously has been recorded from Cát Tiên National Park (Dong Nai province) and Dăk Rong (Gia Lai Province). This is the first record of the species in the Cần Giờ Mangrove Biosphere Reserve (Ho Chi Minh City area), southern Vietnam.

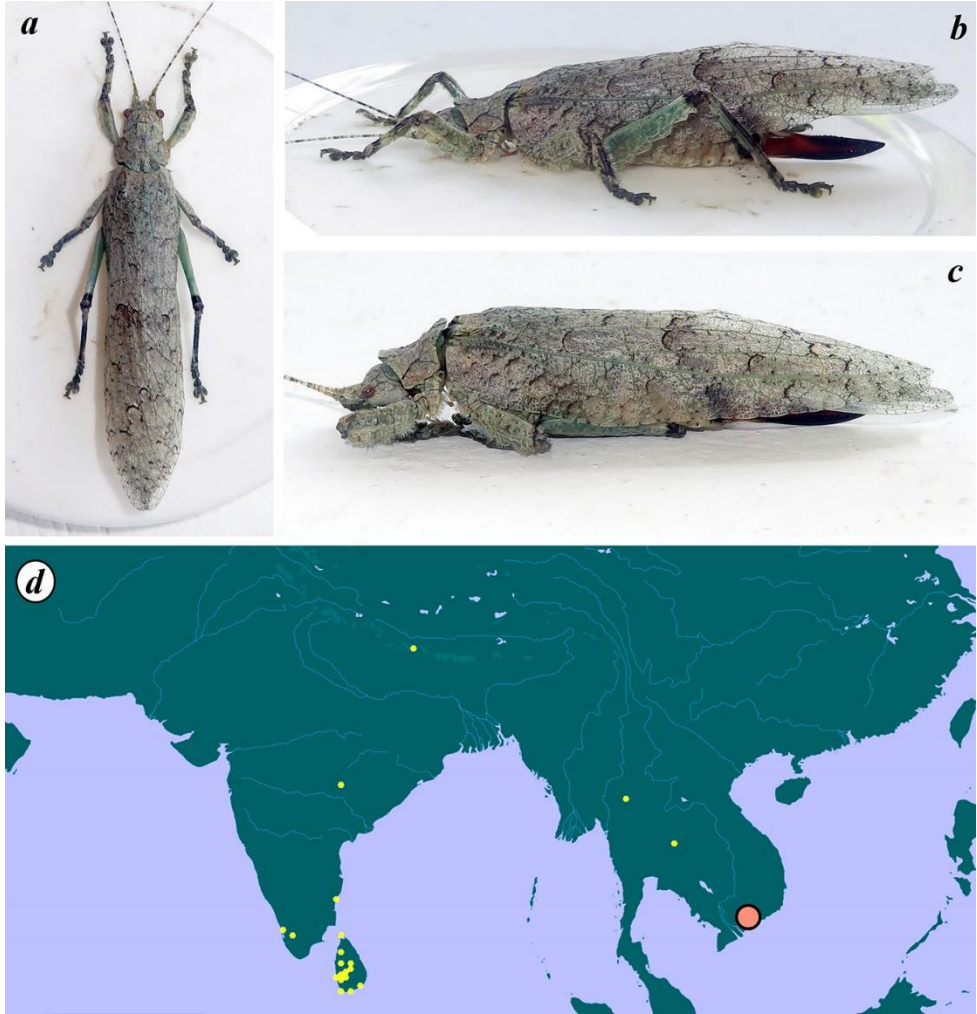


Figure 1. Collected female of the Asian bush crickets *Sathrophyllia rugosa* (Linnaeus, 1758) (Orthoptera, Tettigoniidae) from the Cần Giờ Mangrove Biosphere Reserve (*a-c*) and the map of its distribution (*d*) (taken from the GBIF platform ([www.gbif.org](http://www.gbif.org))). Small yellow circles represent previous published records; large red circle indicates a new record in southern Vietnam.

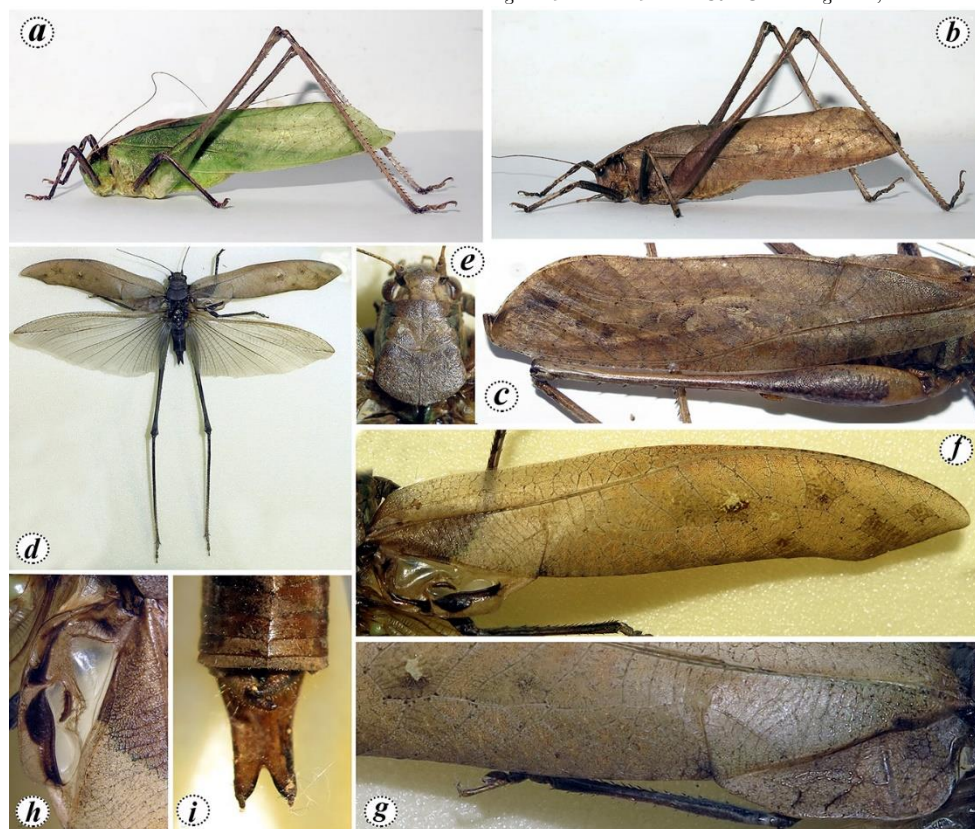


Figure 2. True grasshoppers *Mecopoda fallax* He, 2019 (*a*, female; *b*, *c* male) and *Mecopoda elongata* (Linnaeus, 1758) (*d*-*i*, female) (Orthoptera, Tettigoniidae) from the Cần Giờ Mangrove Reserve in southern Vietnam: *a*, *b* - general lateral view; *c* - left tegmen; *d* - general dorsal view; *e* - head with pronotum, dorsal view; *f* - right tegmen; *g* - dorsal field of left tegmen; *h* - stridulatory apparatus; *i* - genital plate, dorsal view.

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## Conflict of interests

The authors declare that they have no competing interests.

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