

The *Convolvulus* related bee species *Plesiopanurgus cinerarius* Cameron, 1907, *Systropha iranica* Popov, 1967 and *S. villosa* Ebmer, 1978 in southern Iran (Apiformes: Andrenidae and Halictidae)

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Summary

Convolvulus-related bee species from Southern Iran were examined. *Plesiopanurgus cinerarius* Cameron, 1907 was recorded for the first time in Iran. The species was found at 15 locations with 65 specimens in the Iran provinces Fars, Hormozgan and Kerman. We also report further discoveries of *Systropha iranica* Popov, 1967 and *Systropha villosa* Ebmer, 1978. Both species are described from Iran, and were found together with *Plesiopanurgus cinerarius* on *Convolvulus acanthocladus*.

Zusammenfassung

Christian Schmid-Egger, Wolf-Harald Liebig: Die mit *Convolvulus* assoziierten Bienenarten *Plesiopanurgus cinerarius* Cameron, 1907, *Systropha iranica* Popov, 1967 und *S. villosa* Ebmer, 1978 im Süd-Iran (Apiformes: Andrenidae und Halictidae). Während einer Sammelreise in den Süd-Iran im Mai 2019 konnten wir verschiedene auf *Convolvulus* (Winde) spezialisierte Bienenarten beobachten. *Plesiopanurgus cinerarius* Cameron, 1907, wurde erstmalig mit exakten Daten für den Iran nachgewiesen. Wir fanden die Art mit 65 Individuen an 15 unterschiedlichen Fundorten zwischen 1000 und 2600 Metern Meereshöhe. An einigen dieser Fundorte fanden wir außerdem *Systropha iranica* Popov, 1967 und *Systropha villosa* Ebmer, 1978. Beide Arten sind aus dem Süd-Iran beschrieben. Alle genannten Tiere flogen an *Convolvulus acanthocladus*, einer Windenart, die dort zur Dornpolsterflora gehört und in Form von stacheligen halbkugelförmigen Büschen wächst.

Introduction

During a collecting trip to southern Iran in Mai 2019, we found flowering *Convolvulus* (Convolvulaceae) plants on nearly all collecting places between Shiraz and Kerman (Figs 11–16). The genus *Convolvulus* is represented in this area by species that forms low thorny bushes with white flowers that are easily recognizable in the landscape (Fig. 12). This gave us the opportunity to examine the *Convolvulus* related bee fauna of this region, and to make various observations. Surprisingly, the dominant species on most places was *Plesiopanurgus cinerarius* Cameron, 1907 (Figs 1–2), described from Quetta in Pakistan. It has a very striking appearance and is known to be very rare in present literature. The species was accompanied by two *Systropha* species, also related to *Convolvulus* and described from southern Iran. On this basis, we report on these species and summarize the existing knowledge.

Plesiopanurgus Cameron, 1907

The genus *Plesiopanurgus* was erected by Cameron (1907) with the newly described *Plesiopanurgus cinerarius* as monotypic. The genus and species is characterized by a special general shape (Figs 3–5), by modified antenna of male (Fig. 6) and by large mouthparts in female (Fig. 8). For genus diagnosis see Michener (2007). Schwammberger (1971) described a second species, *Plesiopanurgus richteri* from southern Iran in the genus



Fig. 1: *Plesiopanurgus cinerarius*-♂ in the afternoon in a *Convolvulus* flower (WL)



Fig. 2: *P. cinerarius*-♀ in a *Convolvulus* flower (WL)

Neopanurgus. Baker (1972) revised *Plesiopanurgus* and described a third species, *Plesiopanurgus ibex*, from Turkey (recently also found in Iran, see Patiny 2012). Finally, Warncke (1987) described *Plesiopanurgus zizus* from southern Morocco and gave recognition charac-

ters for all taxa. Warncke (1987) also put the genus to the rank of a subgenus of *Panurgus* Panzer, 1806, and set the four described species to the rank of subspecies. Michener (2007) did not follow this viewpoint, and moved *Plesiopanurgus* back to the rank of a genus. Patiny (2012) also treated the four taxa as valid species. We follow both authors. For identification of the species see Warncke (1987), for distribution maps of species Patiny (2012).



Fig. 3: *Plesiopanurgus cinerarius*-♂, dorsal view (CSE)

Fig. 4: *Plesiopanurgus cinerarius*-♀, dorsal view (CSE)



Fig. 5: *Plesiopanurgus cinerarius*-♂, lateral view (OLL)



Fig. 6: *Plesiopanurgus cinerarius*-♂, head with modified antenna (OLL)



Fig. 7: *Plesiopanurgus cinerarius*-♂, genitalia (OLL)



Fig. 8: *Plesiopanurgus cinerarius*-♀, head and mouthparts in lateral view (CSE)

Plesiopanurgus cinerarius Cameron, 1907

Taxonomy

The species was described from Quetta in Pakistan by Cameron (1907) in a newly erected genus *Plesiopanurgus*. Later Baker (1972) examined the type material, including males and females, and designated a male as lectotypes.

Collecting and distribution

The species was already only known from the type area in Pakistan and from three locations in southern Iran without exact locations, within the range of our findings (Patiný 2012). During our trip to southern Iran in Mai 2019, we found the species in 15 locations in the provinces Fars, Hormozgan and Kerman. The search was made easier by the fact that *Plesiopanurgus* is oligolectic to *Convolvulus* spp. (Michener 2007), and we found flowering *Convolvulus* plants at many places along our itinerary (Figs 11–16). Since *Plesiopanurgus cinerarius* flew practically everywhere we examined *Convolvulus* spp., we suspect that the species is common and abundant in large parts of southern Iran at the suited altitude. The type location in Quetta is around 500 kilometers east of Kerman, the easternmost place where we were found the species. It can therefore be assumed that *Plesiopanurgus cinerarius* is also widespread in the intermediate Afghanistan and parts of Pakistan.



Fig. 9: Distribution of *Plesiopanurgus cinerarius* in southern Iran and Pakistan, based on type locality (Quetta, point on the far right,) and records listed here (WL); Yandex Map (MultiBase)

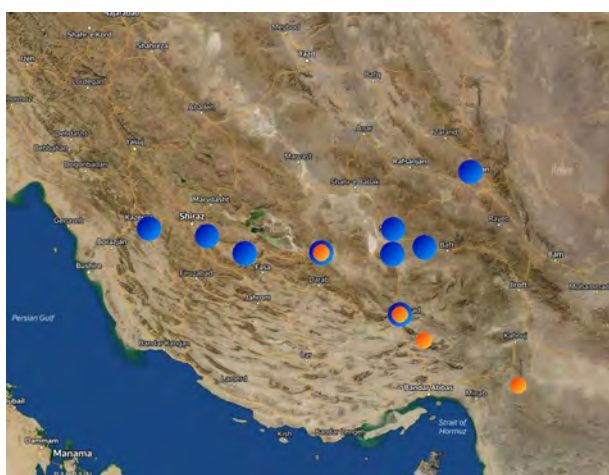


Fig. 10: Distribution of *Systropha iranica* (blue) and *S. villosa* (orange) in southern Iran, based on records listed here and type localities. Type locality for *S. iranica*: easternmost blue marking (Kerman) and for *S. villosa*: easternmost orange marking (holotype, 150 km E of Bandar Abbas). Paratype originates from 65 km N of Bandar Abbas (WL). Yandex Map (MultiBase)



Fig. 11: Collecting place 4 km NW Hajjiabad, 1276 m (WL)



Fig. 12: Flowering *Convolvulus acanthocladus*, 4 km NW Hajjiabad (WL)



Fig. 13: Collecting place, 63 km N Kerman, 2028 m (WL)



Fig. 14: Collecting place, 12 km W Qatrueh, 1755 m (WL)



Fig. 15: Collecting place, 7,5 km NW Birdak, 1839 m (WL)



Fig. 16: Collecting place, 3,4 km NE Zanjan, 1776 m (WL)

Life history

We found the species always on „thorn bush shaped“ *Convolvulus* plants. Some photographs were identified as *Convolvulus acanthocladus* Boiss. & Kotschy by an expert (Fig. 12), but it is also possible that there are other related *Convolvulus* species in the same region. The females were often observed when collecting pollen, and the males were flying around the shrubs and also feeds on the flowers. We found *Plesiopanurgus cinerarius* between 1000 and 2600 meters a.s.l., 2600 meters was also the highest point where we found *Convolvulus* plants. There is no information about nesting activities, but the species most likely nests in the ground as other Panurgini. Daily activity of the bees was from 10:00 p.m. to 2:00 a.m. Later in the afternoon, we found males sleeping in the flowers (Fig. 1).

Material examined

We recorded a total of 65 specimens of *Plesiopanurgus cinerarius*, which belong to 40 males and 25 females. The locations and dates are listed below. The sex and number of collected species is not indicated, but on nearly all location, males and females appeared together, and on most places we observed much more specimens as collected. The specimens mentioned here are collected and stored in the collections of CSE and WL.

An unpublished single male record stored in the OLL (Biologiezentrum des Oberösterreichischen Landesmuseums Linz) is also added.

- Fars prov., Birdak 7,5 km NW 29.199 N, 53.35 E, 1826 m a.s.l., 16.05.2019 (Fig. 15)
- Fars prov., Haji Abad 2,5 km SW 29.185 N, 54.139 E, 1677 m a.s.l., 15.05.2019
- Fars prov., Qatrueh 12 km W 29.206 N, 54.582 E, 1762 m a.s.l., 15.05.2019 (Fig. 14)
- Fars prov., Qatrueh 19 km E 29.159 N, 54.908 E, 1755 m a.s.l., 15.05.2019
- Fars prov., Schiras 19 km SE 29.438 N, 52.753 E, 1509 m a.s.l., 16.05.2019
- Fars prov., Zanjan, 3,4 km NE 29.075 N, 52.654 E, 1776 m a.s.l., 17.05.2019 (Fig. 16)
- Fars Prov., Dasht Aryjan, 29.641 N 51.914 E, 2040 m a.s.l., 6.05.2016 (leg. Kafka, coll. OLL)
- Hormozgan prov., Hajjiabad 4 km NW 28.333 N, 55.844 E, 1276 m a.s.l., 5.05.2019 (Figs 11–12)
- Kerman prov., Kerman 25 km N 30.544 N, 56.977 E, 1869 m a.s.l., 7.05.2019
- Kerman prov., Kerman 38 km N 30.660 N, 56.972 E, 2103 m a.s.l., 7.05.2019
- Kerman prov., Kerman 63 km N 30.886 N, 57.010 E, 2028 m a.s.l., 7.05.2019 (Fig. 13)
- Kerman prov., Ostur 10 km SE 29.281 N, 56.239 E, 2141 m a.s.l., 14.05.2019
- Kerman prov., Sirch 2 km W 30.190 N, 57.502 E, 1948 m a.s.l., 8.05.2019
- Kerman prov., Sirdschan 10 km NE 29.531 N, 55.744 E, 1829 m a.s.l., 6.05.2019
- Kerman prov., Sirdschan 24 km S 29.188 N, 55.730 E, 1764 m a.s.l., 5.05.2019
- Kerman prov., Sirdschan 45 km S 29.016 N, 55.785 E, 1764 m a.s.l., 5.05.2019

Systropha Illiger, 1805

In the same region we recorded two species of the genus *Systropha*, *S. iranica* Popov, 1967 and *S. villosa* Ebmer, 1978. Species of *Systropha* were identified by the key of Patiny & Michez (2006), and by P. A. Ebmer. *Systropha villosa* was described from 150 km east of Bandar Abbas in southern Iran, and by a paratype from 60 km north of Bandar Abbas, and *Systropha iranica* was described from Kerman (Ebmer 1978). Both species are only known from Iran. These species were much rarer in our sample than *Plesiopanurgus cinerarius*, but always occur together with them on flowering *Convolvulus*. The genus *Systropha* is also known to be oligolectic on *Convolvulus* spp. For exact collecting data see below. The specimens mentioned here are collected and stored in the collections of CSE and WL.

Material examined*Systropha iranica*

- Fars prov., Birdak 7,5 km NW 29.199 N, 53.350 E, 1839 m a.s.l., 16.05.2019, 6 ♂♂ (Fig. 15).
- Fars prov., Parishan, 1,3 km N 29.543 N, 51.816 E, 1180 m a.s.l., 18.05.2019, 1 ♂
- Fars prov., Qatrueh 12 km W 29.206 N, 54.582 E, 1755 m a.s.l., 15.05.2019, 2 ♂♂ (Fig. 14)
- Fars prov., Schiras 19 km SE, Maharlu Lake 29.438 N, 52.753 E, 1509 m a.s.l., 16.05.2019, 1 ♂
- Hormozgan prov., Hajjiabad 4 km NW 28.333 N, 55.844 E, 1276 m a.s.l., 5.05.2019, 1 ♂, 1 ♀ (Fig. 11)
- Kerman prov., Ostur 10 km SE 29.281 N, 56.239 E, 2141 m a.s.l., 14.05.2019, 1 ♀
- Kerman prov., Sirdschan 10 km NE 29.531 N, 55.744 E, 1829 m a.s.l., 6.05.2019, 1 ♀
- Kerman prov., Sirdschan 24 km S 29.188 N, 55.730 E, 1784 m a.s.l., 5.05.2019, 1 ♂

Systropha villosa

- Hormozgan prov., Hajjiabad 4 km NW 28.333 N, 55.844 E, 1276 m a.s.l., 5.05.2019, 3 ♂♂, 5.05.2019 (Fig. 11)
- Fars prov., Qatrueh 12 km W 29.206 N, 54.582 E, 1755 m a.s.l., 15.05.2019, 7 ♀♀ 15.05.2019 (Fig. 14)

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- References for photographs: CSE = C. Schmid-Egger, WL = W. Liebig, OLL = F. Gusenleitner and E. Ockermüller, Biologiezentrum Linz Austria.

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