

Table 1. Taxonomy and known distributions of the 8 extant species of prothalangopsid.

Species	Subfamily	Distribution	Citation
<i>Cyphoderris buckelli</i>	Cyphoderrinae	North America/Canada, West	Hebard, 1934
<i>Cyphoderris monstrosa</i>	Cyphoderrinae	North America/Canada, West	Uhler, 1864
<i>Cyphoderris strepitans</i>	Cyphoderrinae	North America/Canada, West	Morris & Gwynne, 1978
<i>Paracyphoderris erebeus</i>	Cyphoderrinae	Russian far-East	Storozhenko, 1980
<i>Aboilomimus guizhouensis</i>	Prothalangopsinae	South central China	Liu et al., 2009
<i>Aboilomimus sichuanensis</i>	Prothalangopsinae	South central China	Gorochov, 2001b
<i>Tarragoilus diuturnus</i>	Prothalangopsinae	South central China	Gorochov, 2001a
<i>Prothalangopsis obscura</i>	Prothalangopsinae	Mostly unknown, but female recovered from Tibet, China	Walker, 1871 (See also Liu et al., 2009)

Table S2. Collection details for specimens used in this study.

Species	Year	Location	Individuals	Study
<i>Cyphoderris monstrosa</i>	2011	Near Paul Lake site, near Kamloops, BC, Canada	3jf	morphology
	2013	Highway 97 site, near Williams Lake, BC, Canada	2jm	morphology
	2013	Near Paul Lake site, near Kamloops, BC, Canada	1jm, 2jf	morphology
	2013	Sunshine Valley Rd. site, near Merritt, BC, Canada, 50° 7'52.30"N; 120°57'48.46"W	1jm	morphology
	2013	Tyax Lodge site, BC, Canada, 50°57'6.84"N; 122°46'23.92"W	1jm	morphology
	2013	Wolf Rd. site, Williams Lake, BC, Canada, 52° 9'33.84"N; 122° 8'25.15"W	4jm	morphology
	2018	Barrier Lake Field Station, AB, Canada, 51° 1'53.02"N; 115° 1'44.93"W	9am, 5af, 2jf	morphology
	2018	Monck Provincial Park, BC, Canada, 50°10'37.48"N; 120°32'7.22"W	5am, 4af	morphology
	2018	McQueen Lake, BC, Canada, 50°49'52.75"N; 120°26'38.73"W	5am, 3af, 2jf	morphology
	2019	Blue Lake site, William Switzer Provincial Park, AB, Canada, 53°28'57.17"N; 117°48'4.84"W	4am, 4af, 1jm, 1jf	acoustics
<i>C. buckelli</i>	2009	Forks site, near Nelson, BC, Canada, 49°36'59.56"N; 117° 7'46.01"W	2am, 2af	morphology
	2009	Dick Hart site, near Kamloops, BC, Canada 50°52'9.07"N; 120°13'29.05"W,	2am	morphology
<i>C. strepitans</i>	2009	Grand Teton National Park, Wyoming, USA	2am, 2af	morphology
<i>Paracyphoderris erebeus</i>	2011	Byreyinskii Nature Reserve, Russia, 52°01'N; 135°05'E	1am	morphology

Adult male (am), adult female (af), juvenile male (jm), and juvenile female (jf).

Supplementary figure 1

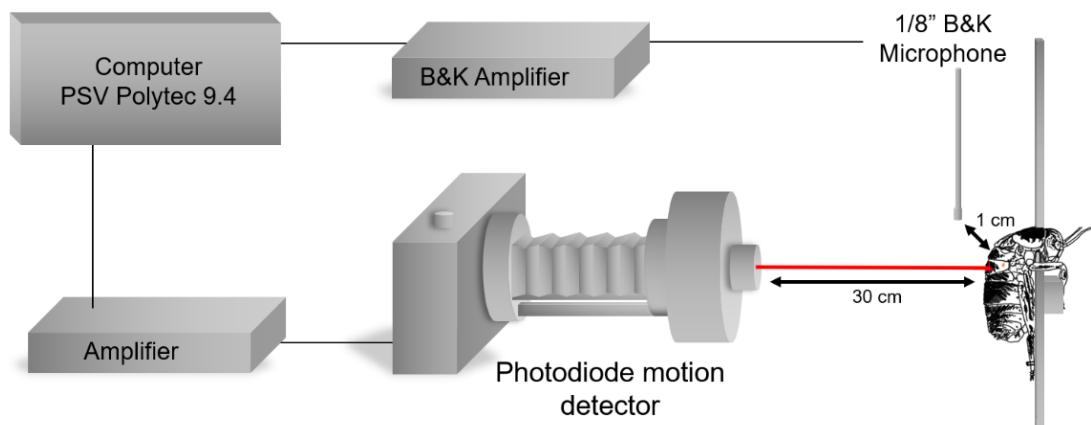


Figure S1. Method of recording the motion and acoustics of Ander's organ. Motion detector custom made and controlled by a single plain photodiode to record motion in only a vertical axis.

Supplementary figure 2

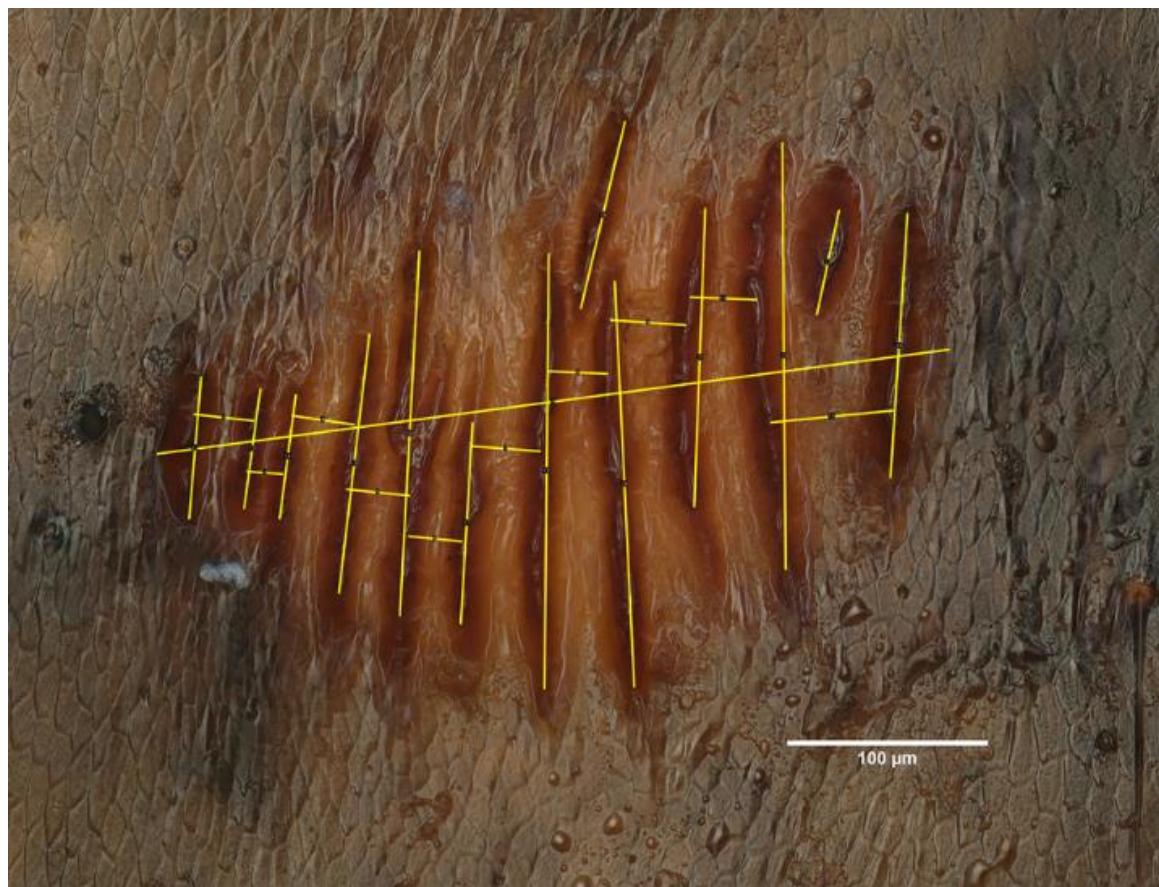


Figure S2. Measurement parameters for the morphological features of Ander's organ stridulatory file. Tooth length is the dorsal to ventral length of the centre of each stridulatory tooth. Inter-tooth distance is the distance between the centre of two adjacent teeth. File length is a measure of the centre of the most anterior tooth to the centre of the most posterior tooth. 'Accessory teeth' not in the line of the file were not used in measurements or counts.

Supplementary figure 3

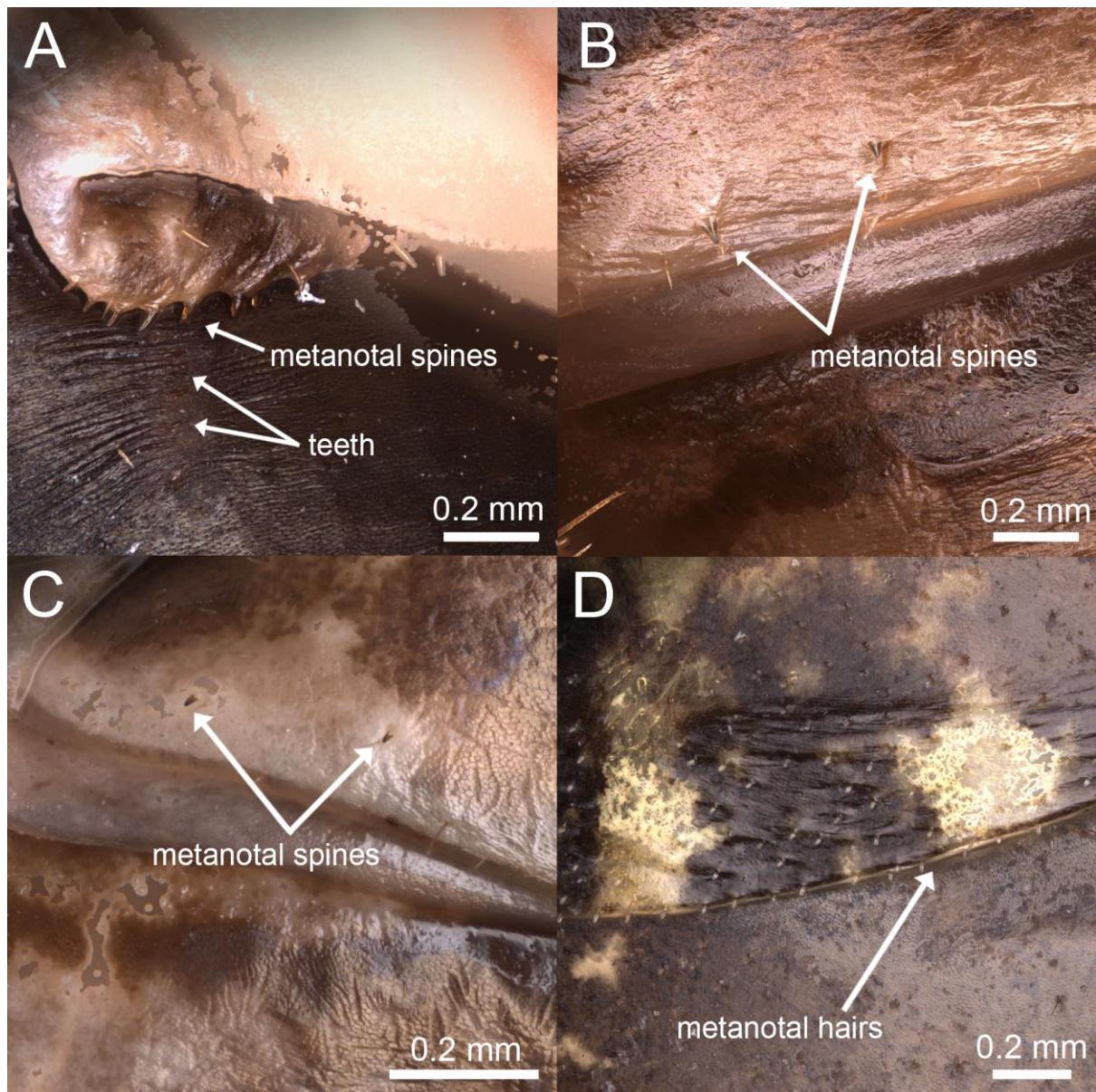


Figure S3. Anatomy of the metanotal edges of various extant prothalangopsids, displaying remnants of organs similar to that of Ander's organ. A, *Paracyphoderris erebeus*; B, *Cyphoderris strepitans*; C, *Cyphoderris buckelli*; D, *Tarragoilus diuturnus*.

Supplementary figure 4.

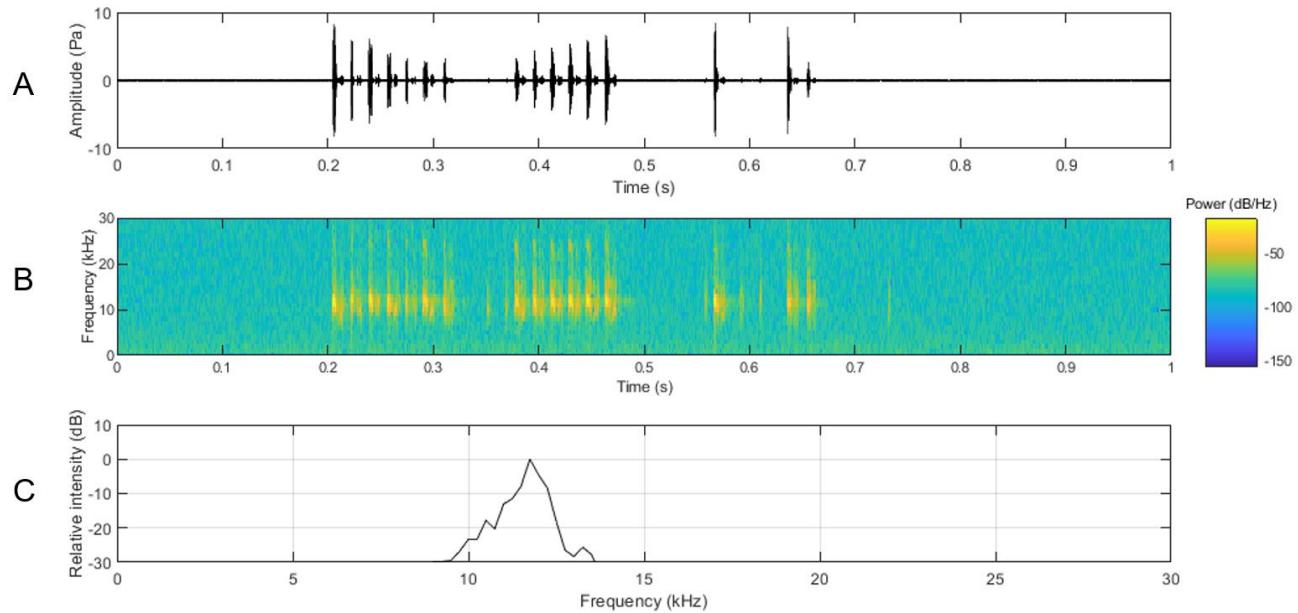


Figure S4. Male defensive acoustics of *Cyphoderris monstrosa*, produced by tegminal stridulation. A, sound waveform; B, spectrogram; C, frequency spectrum.

Supplementary references

- Gorochov, A.V.** (2001a). New taxa of Anostostomatidae and Prophalangopsidae (Orthoptera). *Zoosystematica Rossica*, **9**, 299-315.
- Gorochov, A.V.** (2001b). The most interesting finds of orthopteroid insects at the end of the 20th century and a new recent genus and species. *J. Orth. Res.*, **10**, 353-367.
- Liu, X.-W., M. Zhou, W. Bi & L. Tang** (2009) New data on taxonomy of recent Prophalangopsidae (Orthoptera: Hagloidea), *Zootaxa*. **2026**: 53-62.
- Storozhenko, S.** (1980). Haglidae, A Family of the Orthoptera New to the USSR. Entomological Review, Washington [English translation of Entomologicheskoe Obozrenie] (Ent. Rev., Washington), **59**, 83-86.
- Morris, G.K., and Gwynne, D.T.** (1978). Geographical distribution and biological observations of Cyphoderris (Orthoptera: Haglidae) with a description of a new species. *Psyche: J. Entomol.*, **85**, 147-167.
- Hebard M.** (1934). Studies in Orthoptera which occur in North America north of the Mexican Boundary. II. Cyphoderris, a genus of katydid of southwestern Canada and the northwestern United States. *Trans. Am. Entomol. Soc.*, **59**, 371-375.
- Uhler, P.B.** (1864). Orthopterological contributions. *Proc. Ent. Soc. Philad.*, **2**, 43-555.