

## Short Communication

# Tiger beetle (Coleoptera: Cicindelidae) records from Kratie Province, Cambodia, with three new country records and an updated checklist for Cambodia

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Cambodia has experienced a surge of interest in its remaining forest ecosystems and associated biodiversity in recent years. Most of the attention has been concentrated on a select number of locations such as the Cardamom Mountains in the southwest and coastal islands, whereas inland lowlands have received little attention. Floodplains in the Mekong Basin are among the most vulnerable areas to environmental pressures associated with rapid economic and demographic development. Thorough documentation of biodiversity is a prerequisite for any conservation efforts in this rapidly changing landscape. Invertebrates are understudied overall, and for even some of the better studied groups such as tiger beetles (Cicindelidae), knowledge is scant. Currently, 53 tiger beetle species have been recorded in Cambodia (Wiesner, 2017) and the most recent additions to the group were by Cassola (2005), Wiesner (2008, 2013, 2014, 2017, 2018) and Matalin (2018a,b).

We report observations of tiger beetles made during a recent survey in central Cambodia, close to the Mekong River (Fig. 1). The “Kdan Mekong 2018 expedition” was coordinated by the Biodiversity Inventory for Conservation initiative and was a biodiversity express survey which sought to update biological knowledge for two regions: Preaek Prasab Wildlife Sanctuary and Sambour Wildlife Sanctuary in Kratie Province, Cambodia. These two regions were identified by WWF Cambodia and the Cambodian Ministry of Environment as requiring field

surveys to provide current information on their biodiversity.

We undertook fieldwork at four study sites during the early wet season (between 28 April and 21 May 2018) within the two regions. Four camp locations in the two regions were visited: BC1 Kampi - at an elevation of 55m (12.61862 N, 106.00154 E), BC2 Praek Prasab - at an elevation of 20m (12.56555 N, 105.95080 E), BC3 Koh Klap - at an elevation of 65m (13.01013 N, 106.06539 E) and BC4 Community forest - at an elevation of 69m (13.019582 N, 105.92679 E) (Fig. 1). More information on the expedition and study region can be found in Jocque *et al.* (2018).

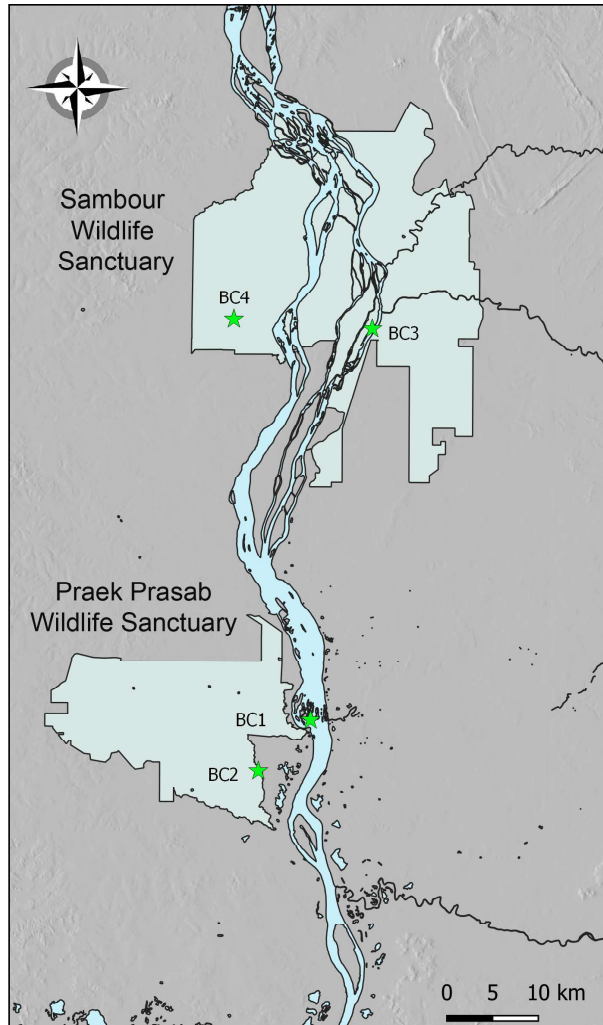
Tiger beetles were collected with malaise traps, pitfall traps and opportunistically with a hand net. Specimens were preserved in 70% ethanol. After identification, most of the material was deposited in the Royal Belgian Institute of Natural History (museum accession number 33.901), and part of the material was deposited in the personal collection of Dr Wiesner Jürgen.

A total of 147 specimens representing 16 species were collected (Table 1). All 16 species are first records for Kratie province, whereas three are new records for Cambodia: *Calochroa carissima* (Fleutiaux, 1919), *Cylindera (Ifasina) spinolae koratensis* Naviaux, 1991 and *Prothyma schmidtgoebeli* Horn, 1895.

*Calochroa carissima* (Fleutiaux, 1919) was almost exclusively collected on sand banks along rivers, both on open

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**Fig. 1** Study area including four basecamps (BC1–BC4) where field surveys were coordinated from in Praek Prasab Wildlife Sanctuary and Sambour Wildlife Sanctuary.

sunny sand bars fringing the Mekong and along the small sandy (1–2 meters wide) edges of a shaded dipterocarp forest river close to BC4. The species is a powerful flyer and difficult to catch during the day. At night, it aggregates on low vegetation about one meter above ground level along these sandy ridges in large numbers, with sometimes over 100 individuals on a single plant (Fig. 2) and can then easily be collected. Tiger beetles from sandy edges of rivers are known to roost on low vegetation at night to avoid predation (Pearson & Anderson, 1985; Bhargav & Uniyal, 2008). *Calochroa carissima* is known from southern Laos mostly along the Mekong, and it is expected to occur all along the Mekong River and its tributaries.



**Fig. 2** *Calochroa carissima* roosting at night in large numbers on low vegetation (© Justin Clause).

*Cylindera (Ifasina) spinolae koratensis* Naviaux, 1991 is only known from a limited number of sites, for instance in western Thailand (Naviaux & Pinratana 2001). We recorded the species almost exclusively on dirt roads and dry river beds in patches of lowland dipterocarp forest. *Cylindera (Ifasina) spinolae spinolae* is more widely distributed and also recorded from Cambodia.

*Prothyma schmidtgoebeli* Horn, 1895 was also only recorded in patches of lowland dipterocarp forest and was commonly observed on dirt roads and dry river beds in the forest. The species is common in the neighbouring countries of Thailand, Laos and Vietnam (Naviaux & Pinratana, 2001) and was expected to occur in Cambodia. Our first country record for the species is indicative of the paucity of information for tiger beetles in Cambodia.

Wiesner (2014) included *Cylindera venosa* in Cambodia tiger beetle fauna in error, as this taxon should be *Cylindera mutata*. *Cylindera mutata* was encountered by Matalin (2018a) and also during our survey on an island in the Kampi area, on the Mekong River (close to BC1).

Our detection of only 16 tiger beetle species reflects the low survey effort and opportunistic nature of our collections. Most of our records were incidental catches at a light trap and in malaise traps. Future surveys of tiger beetles in the region would be most valuable and undoubtedly reveal additional species. For instance, our updated checklist of tiger beetle records in Cambodia brings the national total to 59 species (Appendix 1), which is still very low compared to 133 species in Thailand (Cassola, 2005), 177 species in Vietnam (Wiesner *et al.*, 2017) and 143 species in Laos (Wiesner & Geiser, 2016).

**Table 1** Tiger beetles collected during the Kdan Mekong 2018 expedition. Numbers of males (M) and females (F) collected around the four basecamps (BC1–4) are provided. \* Indicates a single specimen and \*\* indicates two specimens deposited in the collection of Dr Wiesner.

#	Species	BC1		BC2		BC3		BC4		Sum
		M	F	M	F	M	F	M	F	
1	<i>Calomera angulata</i> (Fabricius, 1798)		1	4	6	3	11			25
2	<i>Calochroa harmandi</i> (Fleutiaux, 1893)				1	1	1	9**	8**	20
3	<i>Calochroa carissima</i> (Fleutiaux, 1919)	1			1	2	2	3*	8*	17
4	<i>Cylindera biprolongata</i> (Horn, 1924)					1				1
5	<i>Cylindera khmer</i> Cassola, 2005			6**	1*	2		2		11
6	<i>Cylindera foveolata</i> (Schaum, 1863)			1	1	1		3	1	7
7	<i>Cylindera minuta</i> (Olivier, 1790)	3	4	1	4	2				14
8	<i>Cylindera mutata</i> (Fleutiaux, 1893)	1	1							2
9	<i>Cylindera spinolae koratensis</i> Naviaux, 1991					1		4*	3*	8
10	<i>Lophyra lineifrons</i> (Chaudoir, 1865)			1		1	3	5	2	12
11	<i>Lophyra fuliginosa</i> (Dejean, 1826)			2						2
12	<i>Lophyra striolata striolata</i> (Illiger, 1800)				1			4		5
13	<i>Myriochile sinica</i> (Fleutiaux, 1889)			1	1	1				2
14	<i>Neocolliris bonelii bonelii</i> (Guérin-Méneville, 1834)					1	1	1		3
15	<i>Prothyma bouvieri bouvieri</i> Horn, 1896							1	1	2
16	<i>Prothyma schmidtgoebeli</i> Horn, 1895							8	8	16

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## Appendix 1 Checklist of tiger beetles recorded in Cambodia and their occurrence in neighbouring countries

#	Taxon	Cambodia										Reference for Cambodian Occurrence		
		Unknown	Siem Reap	Pursat	Koh Kong	Sihanoukville	Kampong Speu	Kampot	Kratie	Stung Treng	Rattanakiri		Thailand	Laos
1	<i>Tricondyla (Tricondyla) pulchripes</i> White, 1844	X										X	X	Cassola 2005, p.14
2	<i>Tricondyla (Tricondyla) stricticeps</i> Chaudoir, 1864				X						X	X	X	Matalin 2018a, p.10
3	<i>Tricondyla (Tricondyla) macrodera abruptusculpta</i> Horn, 1925			X									X	Wiesner 2018, p.21
4	<i>Tricondyla (Tricondyla) annulicornis</i> Schmidt-Goebel, 1846				X		X				X	X	X	Matalin 2018a, p.10
5	<i>Protocollyris probsti</i> Naviaux, 1894		X								X	X		Cassola 2005, p.13
6	<i>Neocollyris (Neocollyris) bonellii bonellii</i> (Guérin-Méneville, 1834)		X	X				X			X	X	X	Wiesner 2008, p.75
7	<i>Neocollyris (Neocollyris) stiengensis</i> (Horn, 1914)	X											X	Cassola 2005, p.14
8	<i>Neocollyris (Neocollyris) moesta</i> (Schmidt-Goebel, 1846)		X								X	X	X	Cassola 2005, p.13
9	<i>Neocollyris (Neocollyris) impressifrons</i> (Chaudoir, 1864)	X											X	Cassola 2005, p.14
10	<i>Neocollyris (Neocollyris) fuscitarsis</i> (Schmidt-Goebel, 1846)		X							X	X	X	X	Wiesner 2008, p.75
11	<i>Neocollyris (Neocollyris) rufipalpis</i> (Chaudoir, 1864)	X									X	X	X	Cassola 2005, p.14
12	<i>Neocollyris (Orthocollyris) crassicornis</i> (Dejean, 1825)	X									X	X	X	Cassola 2005, p.14
13	<i>Neocollyris (Leptocollyris) linearis linearis</i> (Schmidt-Goebel, 1846)		X	X							X	X	X	Wiesner 2008, p.75
14	<i>Neocollyris (Leptocollyris) subtilis subtilis</i> (Chaudoir, 1863)						X				X	X	X	Wiesner 2018, p.21
15	<i>Neocollyris (Leptocollyris) cylindripennis</i> (Chaudoir, 1864)	X									X	X	X	Cassola 2005, p.14
16	<i>Neocollyris (Pachycollyris) fasciata</i> (Chaudoir, 1864)	X									X			Cassola 2005, p.14
16	<i>Prothyma (Paraprothyma) exornata</i> Schmidt-Goebel, 1846				X						X	X	X	Wiesner 2018, p.22
18	<i>Prothyma (Paraprothyma) schmidtgoebeli</i> Horn, 1895							X			X	X	X	This study
19	<i>Prothyma (Genoprothyma) heteromalla</i> (MacLeay, 1825)		X								X	X	X	Cassola 2005, p.16
20	<i>Prothyma (Genoprothyma) bouvieri bouvieri</i> Horn, 1896		X			X	X				X	X	X	Wiesner 1992, p.58
21	<i>Heptodonta eugenia</i> Chaudoir, 1865		X	X							X	X	X	Wiesner 2008, p.75
22	<i>Calochroa flavomaculata flavomaculata</i> (Hope, 1831)		X	X							X	X	X	Wiesner 2008, p.76

## Appendix 1 Cont'd

#	Taxon	Cambodia											Reference for Cambodian Occurrence	
		Unknown	Siem Reap	Pursat	Koh Kong	Sihanoukville	Kampong Speu	Kampot	Kratie	Stung Treng	Rattanakiri	Thailand		Laos
23	<i>Calochroa carissima</i> (Fleutiaux, 1919)								X		X	X		This study
24	<i>Calochroa mouhotii</i> (Chaudoir, 1865)	X									X	X		Cassola 2005, p.14
25	<i>Calochroa elegantula</i> (Dokhtouff, 1882)					X					X	X	X	Wiesner 2014, p.144
26	<i>Calochroa interruptofasciata interruptofasciata</i> (Schmidt-Göbel, 1846)	X									X	X	X	Cassola 2005, p.17
27	<i>Calochroa interruptofasciata flavolineata</i> (Chaudoir, 1865)		X			X				X	X	X		Wiesner 2008, p.76
28	<i>Calochroa harmandi</i> (Fleutiaux, 1893)							X					X	Wiesner 1992, p.107
29	<i>Calochroa bramani</i> (Dokhtouff, 1882)	X	X			X				X	X	X	X	Wiesner 2018, p.22
30	<i>Calomera angulata angulata</i> (Fabricius, 1798)					X	X	X		X	X	X	X	Matalin 2018a, p.14
31	<i>Calomera plumigera scoliographa</i> (Rivalier, 1953)	X									X	X	X	Cassola 2005, p.14
32	<i>Calomera funerea funerea</i> (Macleay, 1825)		X							X	X	X	X	Matalin 2018a, p.15
33	<i>Cosmodela juxtata</i> (Acciavatti & Pearson, 1989)			X	X	X	X			X	X	X	X	Wiesner 2008, p.76
34	<i>Cosmodela virgula</i> (Fleutiaux, 1893)	X									X	X	X	Cassola 2005, p.14
35	<i>Lophyra (Lophyra) fuliginosa</i> (Dejean, 1826)				X	X	X			X	X	X	X	Wiesner 2008, p.76
36	<i>Lophyra (Lophyra) cancellata cancellata</i> (Dejean, 1825)	X									X	X	X	Cassola 2005, p.14
37	<i>Lophyra (Spilodia) striolata striolata</i> (Illiger, 1800)		X	X				X		X	X	X	X	Wiesner 2008, p.77
38	<i>Lophyra (Spilodia) lineifrons</i> (Chaudoir, 1865)	X	X	X		X	X	X		X	X	X	X	Wiesner 2008, p.77
39	<i>Naviauxella ramai</i> Naviaux, 1991	X									X	X		Cassola 2005, p.18
40	<i>Naviauxella loebli</i> Matalin, 2018									X				Matalin 2018b, p.2
41	<i>Naviauxella labiosa</i> Naviaux, 1996									X			X	Matalin 2018a, p.12
42	<i>Cylindera (Ifasina) foveolata</i> (Schaum, 1863)	X	X			X	X			X	X	X	X	Wiesner 2008, p.77
43	<i>Cylindera (Ifasina) viduata</i> (Fabricius, 1801)	X	X	X		X				X	X	X	X	Wiesner 2008, p.77
44	<i>Cylindera (Ifasina) khmer</i> Cassola, 2005	X						X						Cassola 2005, p.18
45	<i>Cylindera (Ifasina) viridilabris</i> (Chaudoir, 1852)									X	X			Matalin 2018a, p.13
46	<i>Cylindera (Ifasina) spinolae spinolae</i> (Gestro, 1889)				X						X	X	X	Wiesner 2008, p.77
47	<i>Cylindera (Ifasina) spinolae koratensis</i> Naviaux, 1991							X			X			This study
48	<i>Cylindera (Ifasina) decempunctata</i> (Dejean, 1825)	X									X	X	X	Cassola 2005, p.14
49	<i>Cylindera (Ifasina) juergenwiesneri</i> Naviaux, 1991	X									X			Cassola 2005, p.20
50	<i>Cylindera (Eugrapha) minuta</i> (Olivier, 1790)		X			X	X			X	X	X	X	Wiesner 2017, p.44
51	<i>Cylindera (Eugrapha) mutata</i> (Fleutiaux, 1893)							X	X		X	X	X	Matalin 2018a, p.14
52	<i>Cylindera (Eugrapha) biprolongata</i> (Horn, 1924)							X	X		X	X		Matalin 2018a, p.13
53	<i>Myriochila (Myriochila) sinica</i> (Fleutiaux, 1889)	X	X			X	X			X	X	X	X	Wiesner 2018, p.24
54	<i>Myriochila (Myriochila) specularis specularis</i> (Chaudoir, 1865)					X				X	X	X	X	Wiesner 2018, p.24
55	<i>Abroscelis tenuipes tenuipes</i> (Dejean, 1826)	X											X	Cassola 2005, p.14
56	<i>Abroscelis tenuipes araneipes</i> (Schaum, 1863)				X								X	Wiesner 2008, p.78
57	<i>Callytron nivinctum nivinctum</i> (Chevrolat, 1845)	X											X	Cassola 2005, p.14
58	<i>Callytron andersonii</i> (Gestro, 1889)	X								X	X	X	X	Cassola 2005, p.14
59	<i>Enantiola hewittii</i> (Horn, 1908)	X											X	Cassola 2005, p.14