



S.V.C. CARDAMOM EXPEDITION REPORT

***Naturalist expedition to Phnom Aural and Phnom Tumpuor
Cardamom Mountains, Cambodia***

24 january – 10 february 2006



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S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

1. INTRODUCTION

Three naturalists and one amateur video-maker conducted an expedition to the higher altitude forests of Phnom Aural Wildlife Sanctuary and of Phnom Tumpuor complex within Phnom Samkos Wildlife Sanctuary in January-February 2006. The team was multi-disciplinary and consisted of two experienced ornithologists (ten-year experience in Cambodia or Southeast Asia) and one junior Cambodian entomologist. Additionally, one of the ornithologists has skills in reptile and amphibian survey and identification. The expedition was endorsed by a letter of the Ministry of Environment (DNCP) and up-to-date information about security, access, guides and practicalities was kindly provided by *Fauna and Flora International* (FFI) Cambodia program. The expedition costs were partly covered by the *Sam Veasna Center* (SVC) entomological program, funded by the *Royal Belgian Institute of Natural Sciences* (RBINS).

2. ITINERARY AND GAZETTEER

The expedition was conducted from 24 January to 10 February 2006. One week was devoted to each survey site. The team included the four aforementioned persons plus two local villagers as guides and carriers.

Date	Itinerary	Main habitat
Phnom Aural Wildlife Sanctuary		
24 Jan	From PP to <i>Srekèn</i> village (4WD-vehicle)	Secondary shrub + dry deciduous forest
25 Jan	From <i>Srekèn</i> to Camp 1 (oxcart + on foot)	Dry deciduous + lowland evergreen forest
26 Jan	Camp 1 (~500 masl) to Camp 2 (1000 masl)	Lowland and hill evergreen forest
27 Jan	Around camp site	Hill evergreen forest
28 Jan	Walk up to one peak at about 1500 masl	Hill evergreen + dwarf evergreen forest
29 Jan	Around camp site	Hill evergreen forest
30 Jan	From Camp 2 to summit (1771 masl), then down to Camp 3 (altitude? ~ 800-1000 masl)	Hill evergreen + dwarf evergreen forest
31 Jan	From Camp 3 up and down slopes and ridges to Camp4 (altitude? ~ 500-600 masl)	Mostly hill evergreen forest
1 Feb	Camp 4 down to village, then by motorbike to <i>Lapieng</i> village, Kompong Chhnang province	Lowland evergreen forest, degraded on lower slopes (logging) / dry deciduous forest
Travel from Phnom Aural area to Phnom Tumpuor area		
2 Feb	<i>Lapieng</i> village to <i>Romeas</i> (trailer), then to Pursat town (taxi)	Dry deciduous forest, then farmed countryside and town
3 Feb	From Pursat town to <i>Pramaoy</i> (taxi), then to Tumpuor village (motorbike)	Dry deciduous forest
Phnom Tumpuor (Phnom Samkos Wildlife Sanctuary)		
4 Feb	Walk from Tumpuor village along Tumpuor river (old logging track), then up steep slope	Degraded lowland evergreen forest (logging + slash and burn) + secondary growth (fire)
5 Feb	Walk up to ridge then to "high plateau" area	Secondary growth + hill evergreen forest
6 Feb	Around campsite (1100 masl)	Hill evergreen forest
7 Feb	Walk up to Tumpuor summit (1434 masl)	Hill evergreen + dwarf evergreen forest
8 Feb	Around camp (AM) / South to streams (PM)	Hill evergreen forest
9 Feb	South to stream (AM) / Around camp (PM)	Hill evergreen forest
10 Feb	Walk down along ridge to Tumpuor river and to Tumpuor village	Hill evergreen, secondary growth (fire), degraded forest (slash-and-burn, logging)

Gazetteer:

Waypoint	Description	Easting	Northing
I	Aural Camp 1	0405206	1327304
II	Aural Camp 2	0407083	1328839
III	Aural Camp 3	0412660	1330417

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

IV	River	0413902	1332553
V	Foothill village Kpg Chhnang	0418038	1332505
VI	Stoeng Tumpuor (departure)	0291132	1371431
VII	Tumpuor ridge on trail up	0290521	1369593
VIII	Tumpuor Camp on plateau	0289599	1368594

3. OBJECTIVES AND METHODS

The trip had three main objectives:

1. ornithology: to study birds from hill evergreen forest;
2. herpetology: to survey for reptiles and amphibians;
3. entomology: to collect a representative sample of insect specimen (excluding Lepidoptera) and other invertebrates for later identification.

Birdwatching formed the primary objective of the trip. Birds were searched for opportunistically in the forest around the main camp mainly, i.e. at around 1000 to 1200 masl in hill evergreen forest. Birds encountered during the walk up to or down from the camp sites were recorded as well, as were birds seen en route from / to the expedition sites. Birds were detected and/or identified by calls and/or sight using binoculars and Robson's Field Guide to the Birds of Southeast Asia. Playback of prerecorded calls was occasionally used to bring elusive species in view (*Timalidae*, *Cyornis spp.*, night birds). When conditions allowed, birds were photographed with a digital camera (Canon EOS 350 D) equipped with 100-400 mm lens.

Sightings and signs of mammals were also recorded and species tentatively identified.

Snakes, lizards and amphibians were searched along streams and rivers at night (20:00 to 22:00) on most expedition days, aided by a spotlight. Reptiles found were photographed in their natural environment (sometimes after being caught, e.g. in case of snakes). Photos taken with 100 mm macro lens will allow later confirmation of identification.

Insects were collected using two methods: a hand sweep net and Malaise interception traps. The first method was used during daylight. Collected specimens were placed in labeled alcohol bottles by broader taxonomical group (order or group of related families). Two Malaise traps were set for four to six days at each survey site: one at the foothills and one near the main altitude camp. Trapped insects were kept in the original alcohol bottle. Light trapping was also attempted twice near the village at the base of the mountains (Srekèn and Tumpuor villages) but failed in both cases as the first generator did not work while the second generated too little power to light the 160-watt bulb.

4. RESULTS

The team recorded 194 bird species, eleven mammals, nine reptiles and five amphibians. A selection of key findings is presented in this section. Full species lists figure in the annexes.

4.1. Mammals

The only fresh signs of large mammal concern large bovids, most probably Gaur *Bos gaurus*.

They were all made in Phnom Aural:

- fairly fresh dung near Camp 1 site at about 500 masl;
- foot prints in a wallow at about 1500 masl (near the first peak from Camp 2);
- roosting site of a small herd further up in the same area (almost at the top of the peak).

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

Although our local guide Mr Chhim, attributed the two latter signs to Banteng *Bos javanicus*, habitat and altitude strongly suggest Gaur, which is consistent with previous survey findings (Daltry 2002). A photograph of the foot print was taken.

No other signs of recent presence of very large mammals (elephants, large cats, cattle) were found. Few conclusions can be drawn from these incidental observations, as mammal signs were not systematically searched for by the expedition members. However, one can note that previous dedicated survey in Phnom Aural WS obtained similar results and concluded to the absence/extirpation of large mammals other than Gaur (Daltry 2002). Conversely, the absence of Gaur and Elephant signs in Phnom Tumpuor contrasts with previous surveys (Daltry and Momberg 2000). In 2000, signs of Asian Elephant *Elephas maximus* were recorded and Gaur was found abundant on the Tumpuor plateau where our team camped for 5 days. The present situation may reflect movements of these species or declines due to hunting, trapping and disturbance. In this context, the camera-trap survey currently undertaken in Phnom Tumpuor is timely to ascertain the present conservation status of Gaur.

Other species of interest included one large black-and-rufous *Callosciurus* squirrel, seen on a large tree near Aural camp 1. Surprisingly, that species has not been listed for the Cardamoms by FFI, and this may therefore constitutes the first record.

4.2. Bird records

Of the 201 bird species figuring in the annexes, 194 species are confirmed and seven species are provisional (identification inconclusive). Only records of interest are presented here. These include:

- species not yet listed for the Cardamom range;
- sightings adding to our conservation, distributional or ornithological knowledge.

Chestnut-headed Partridge *Arborophila cambodiana* (GT- Endangered)

Calls of *Arborophila sp.* were often heard around Aural Camp 2. The calls were a long whistle of one repeated note, slightly more vibrating and louder towards the end. They are similar to the first part of the call of Scaly-breasted Partridge *A. chloropus*, and were therefore attributed to that species. This could however not been ascertained through sighting of a bird. Two *A. cambodiana* were seen crossing a ridge on the morning of 31 January at Aural Camp 3. Small flocks totaling minimum six birds were also detected on the associated slopes (same time and place) – walking and flushed – but could not been observed. In Tumpuor mountain range, the species was seen on 6, 7 and 8 February, and heard on the 9 February. The partridge was encountered in small parties (usually four birds) around the camp site as well on the slope up Tumpuor summit (i.e. 1000 to 1400 masl). The typical call was a series of one-note whistle, monotonous, similar in tone to *A. chloropus* but less vibrated. Birds also uttered a subdued contact call (soft, shorter whistle). The species can be regarded as common in Mount Tumpuor area and not under any significant threat: no people were met during out stay, no snares were found. In Phnom Aural, our limited observations do not allow any status assessment. The species may be fairly common but overlooked if silent. As the species is similarly common in the rest of the Cardamom range and as habitat and hunting pressure are currently low, the species conservation status should be revised and possibly downgraded to Near-threatened.

[Spot-bellied Eagle Owl *Bubo nepalensis*]

One very large owl was flushed from middle storey of hill evergreen forest on Tumpuor plateau (1100 masl) on 7 February morning. The bird could not be conclusively identified but the size and grey-brown color (wings and upper body) without any rufous tinge indicate *Bubo nipalensis*. That species is not listed for the Cardamom and Elephant mountains by FFI, although there is an historical record from the Kampot-Bokor area.

Oriental Scops Owl *Otus sunia*

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

Hear calling (three birds) at night on 24 January near Sreken village. Not listed for the Cardamoms by FFI, but likely to occur in lowlands forests. A little known species in Cambodia.

Peregrine Falcon *Falco peregrinus*

One pair was observed from a ridge nearby a rock cliff in Tumpuor mountain on 5 February and again at the same spot on 10 February. The birds were very dark grey above with a paler rump and densely barred below; the head had a complete black hood. These features fit *F.p. ernesti*, a subspecies not previously recorded in Indochina. It is known as a resident form in South Thailand and Peninsular Malaysia (Robson 2000). Birds uttered alarm calls in flight and, on 10 February, performed display flight. This, added to the fact that the birds were seen at the same place, strongly suggests nesting activity. Presently, the species is only known as a widespread but scarce wintering visitor to Cambodia. If confirmed, this would be the first breeding record of the species for the country.

White-bellied Sea-Eagle *Haliaeetus leucogaster*

One third-year plumage individual was well observed as it flew across road 56, about half-way between Pursat and Pramaoy on 3 February. A GPS point was taken (0353859-1362716) as there are very few inland records of that coastal species. This is arguably the first time in Cambodia that the species was seen over dry dipterocarp forest, and so far away from water bodies (sea, river or lake). The bird was flying northeast, towards the Tonle Sap.

Mountain Hawk Eagle *Spizaetus nipalensis*

One *Spizaetus sp.* briefly seen at close range gliding above the Ta Eysey peak was tentatively identified as that species on 28 January. One pair of very large birds of prey was flushed from perch on the first peak of Phnom Aural on 30 January. The second bird perched a moment in front of one observer (XR), allowing confident identification. It was an immature bird with uniform whitish underparts and a long blackish crest. That species is not listed for the Cardamoms by FFI, though has been recorded in Bokor NP (first country record). It may have been overlooked due to difficulties to separate from Changeable Hawk Eagle *Spizaetus cirrhatius* in the field.

Black Eagle *Ictinaetus malayensis*

One large, dark raptor with characteristic jizz glided just above the canopy of the summit of Phnom Tumpuor on 7 February. The species has been previously recorded in Aural and Samkos, but there are few – if any? – recent records elsewhere in the country. It is a species of regional conservation concern, being listed as threatened in Thailand and Laos.

White-rumped Falcon *Polybierax insignis* (GT-Vulnerable)

One male perched in a small tree on forest edge along the road to Aural district (Kantuot) on 24 January. The species was found in dry secondary growth and shrub, an unusual habitat for this dry dipterocarp forest specialist. The location was about mid-way or less from Kompong Speu turnoff to Kantuot (a few kilometers after an open wetland). The bird was pretty tame, and could be approached, photographed (see annex) and filmed for a while.

This unexpected record is significant as it confirms that this globally threatened species is still present in southwest Cambodia, where there had been no records since historical times (Thomas and Poole 2003).

Lesser Adjutant *Leptoptilus javanicus* (GT-Vulnerable)

A single bird was seen in flight along road 56, at the same location as the White-bellied Sea-Eagle, on 3 February. And an other bird one hour later just before Pramoy.

Woolly-necked Stork *Ciconia episcopus*

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

Two birds were seen in flight along road 56, at the same location as the White-bellied Sea-Eagle, on 3 February.

White-browed Fantail *Rhipidura albicollis*

One bird was observed in the dry dipterocarp forest en route to Phnom Tumpuor village on 3 February. It was surprisingly not listed for the Cardamoms by FFI, as it is a fairly common bird in this habitat.

Silver Oriole *Oriolus mellianus* (GT-Vulnerable)

One female was observed briefly in the higher storey of the forest in Tumpuor mountain on 8 February. This wintering species is known from only two previous records in Cambodia: one historical and one recent record, both from Bokor NP. This is the first record for the Cardamoms *stricto sensu*.

Silver-breasted Broadbill *Serilophus lunatus*

Heard daily in hill evergreen forest on Phnom Aural and Phnom Tumpuor, where views were obtained near the camp. Two empty nests were found in Tumpuor (see annex): one overhanging a gully made by a stream, a second just next to our camp, over the stream. Known breeding season is March to July according to Robson (2000). It is not known whether these were active or abandoned nests. They were in good condition and seemed to have been recently built. There are no specific records of nesting period for this species in Cambodia.

Grey-chinned Minivet *Pericrocotus solaris*

One active nest was noticed on a high branch of a tall tree at Aural Camp 2.

Mountain Bulbul *Hypsipetes mclellandi* (GNT)

A bird commonly heard and seen in the hill evergreen forest of both mountain areas. The subspecies *H. m. canescens* (drab colored) occurs in the Cardamoms. Further work may be indicated to clarify the taxonomical status of this poorly known form.

Sulphur-breasted Warbler *Phylloscopus ricketti*

One bird was among a bird wave in a narrow stream valley, in the canopy on 9 February. This distinctive *Phylloscopus* species is not listed for the Cardamoms by FFI, but has recently been documented from Bokor NP (first country record; see Rheindt 2005).

4.3. Bird communities

The composition and abundance of bird communities in Phnom Aural and Phnom Tumpuor showed some obvious differences though the factors behind these are not always understood. For example, the paucity of Flycatchers in Aural contrasted with their relative abundance in Tumpuor. This may be related to the different nature of the topography and vegetation. Tumpuor features a gently sloping plateau and a rich undergrowth of palms and ferns while Aural consists of steep slopes with a sparser understorey. Moreover, a stream innerves the bottom of the Tumpuor 'plateau', generating a wetter environment.

Blue Pitta *Pitta cyanea* was common around Aural altitude camp, but scarce in similar altitudes and habitat of Tumpuor. The converse situation was noted for Chestnut-headed Partridge. It is interesting to add that the site where the latter species was seen in Aural had also dense fern-palm undergrowth. This may indicate a preference for this type of habitat.

Some species regarded as abundant in Phnom Samkos WS by Steinheimer *et al.* (2000) were simply not found (e.g. Snowy-browed Flycatcher *Ficedula hyperythra*, White-browed Piculet *Sasia ochracea*) or scarce (e.g. Large Niltava *Niltava grandis*). Furthermore, Greater Flameback *Chrysocolaptes lucidus* was

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

heard up to the mountain summits at both sites, contradicting the observation of Steinheimer *et al.* (2000) that “White-browed Piculet was the only resident woodpecker of the higher altitudes”.

4.4. Reptiles

Night search for reptiles were undertaken for 1-2 hours on half of the days, and at all camp sites, as they were in vicinity of water. The low number of species and animals found were somewhat expected in the height of the dry season.

The Modest Keelback *Amphiesma modesta* was the only snake species found. Three specimens were caught along forest stream between 500 and 1100 masl, two in Aural and one in Tumpuor (near camp). This aquatic snake is definitely common and widespread in the Cardamom range.

Three individuals of the endemic Cardamom Banded Gecko *Cyrtodactylus intermedius* were found in a single night around Aural Camp 2 and four individuals near a stream around Aural Camp 4. None was found in Tumpuor mountain, which suggests much lower density or even absence. This is probably at the margin of its natural distributional range.

The most interesting find was one Siamese Leaf-toed Gecko *Phyllodactylus siamensis* seen hunting on a track in the lowlands just outside Tumpuor Leu village, on 3 February. The species had already been recorded in the lowlands of Phnom Samkos WS and a specimen was collected (Daltry and Momberg 2000).

4.5. Amphibians

Dry weather, without a single day of rains, impaired efforts to detect and observe batrachians. Only the more common species found along the forest streams (*Rana mortenseni*) and in countryside (*Mycrohyala sp.*) could be recorded.

4.6. Arthropods

Due to the dry weather, small amount of insects were collected through the Malaise interception traps. Most specimens were caught during the day by hand or sweep net. Invertebrates belonging to 46 identified families of insects (13 orders) and one family of Myriapods (Scolopendrinae) were collected and preserved in alcohol. Lepidoptera were not collected as they are not part of the entomological studies supported by the RBINS.

The material will be further sorted in the SVC in Siem Reap and then sent to Belgium for taxonomical identification. It may take a year before all specimens are properly studied and identified by respective specialists around the world. It is expected that several new species, or even genera, will be described, as this seems to have been the first dedicated survey for non-Lepidoptera insects in the higher altitudes of the Cardamom range. Previous entomological study had been conducted under the same project by Var Inarriddh (SVC) and Koen Smets (RBINS) in May 2005, but focused in the lowlands around Pramaoy area (Phnom Samkos WS)

5. THREATS

The forests of higher altitudes (above 800m), both in Aural and Tumpuor, have undergone little human impact, apart from harvesting of some non-timber forest products. The forests were old and in near pristine conditions. Human presence was found minimal during the time spent by our team in the altitude camps.

5.1. Phnom Aural

One group of 15+ villagers from Kompong Chhnang side (La Pieng village) was encountered near the altitude camp. They were searching for the valuable *Chan Kreasna* wood (*Aquilaria sp.*) in small groups. One villager said one kilogram of this perfumed wood fetches US\$ 2,000. The villagers were brought in (and paid) by a leader for their work, and were planning to stay two weeks in the forest. At the time we met them, they had found only small piece of perfumed *Chan Kreasna* wood.

Signs of hunting were limited to two disused large mammal traps. The accompanying guides associated the traps with Sunbears (or Black Bears), which they saw transiting or for sale in their village a while ago. No gunshots were heard during the stay in the altitude camps, suggesting low firearm hunting pressure.

Logging evidences were most prevalent on the eastern slopes below 500 meters, during our last day down to the villages. These included groups of villagers camping near processed wooden planks, remains of logged trees and planks, one active oxcart track, processions of ox carts heading to the hill slopes to collect timber or coming back to the villages with timber. The main activity of the environmental officers (rangers) posted on the access track to Aural in Kompong Chhnang, is apparently to collect 'logging fees' from villagers transporting timber. Rangers are not from the local communities and confessed they had never walked to the top. Patrolling and enforcement appear to be largely inexistent.

5.2. Phnom Tumpuor

No people were encountered and no sign of recent human presence was detected during the five days spent on the Tumpuor plateau.

Two disused large mammal traps similar to those seen in Aural were found, and associated with similar stories of bear poaching.

An intense, widespread and long-lasting fire event has completely devastated slopes in at least two valleys (including that of the Tumpuor stream) in 2005. The fire had apparently been lit for slash-and-burn agriculture on the foothills, and then went out of control and spread out to the slopes by wind. Our guides said the forest had burned for over one month. During the climb, we noticed that the soil was covered with ashes and that rocks have been fragmented by the heat. The secondary vegetation was dominated by sharp-edge grasses, thorny scrub and bamboos.

No evidence of active logging was witnessed, although there is an old, overgrown logging track heading of the Tumpuor stream (waypoint VIII). The major cause of habitat degradation / loss on the lower slope and foothills is clearing and burning for agriculture. Some patches of lowland evergreen forest subsist near Tumpuor village. They will not last long if not effectively protected.

Due to administrative reorganization, all the rangers were back to their office during the time of our visit. Therefore, the patrolling and enforcement level could not be assessed.

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S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

official endorsement of the expedition. Sincere thanks go to our local guides Mr. Chim and Mr. ? from Sréken village, and Mr. Kaa and Mr. Tchat from Tumpuor village. Dr. Patrick Grootaert, of the Royal Belgian Institute for Natural Sciences is thanked for allowing the expedition costs to be partly covered under the RBINS-funded entomological research program.

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ANNEX I – LIST OF MAMMALS RECORDED DURING THE EXPEDITION

Species observed

- 1- Variable Squirrel *Callosciurus finlaysoni*: plain rufous type, with darker band on back and base of tail; present in Phnom Aural (and Phnom Samkos?) in all habitat and altitude range.
- 2- Squirrel *Callosciurus sp.*: one large squirrel was observed on a large tree near Camp 1 in Phnom Aural, in semi-evergreen forest; striking pattern of black (back), rufous (belly) and white (flanks)
- 3- [Cambodian] Striped Squirrel *Tamiops sp.*: a few observations up to 1000 m in Phnom Aural (and Phnom Samkos?); small, back-striped with long thin tail
- 4- Northern treeshrew *Tupaia belangeri*: one seen at close range under a log, near Camp 2 in Phnom Aural, in hill evergreen forest; all brown, long snout.
- 5- Bat sp. *Tadarida sp.*: one flew above Camp 2; fairly large microchiroptera, with a free tail indicate *Tadarida* genus.
- 6- Common Palm Civet *Paradoxurus hermaphroditus* : one seen in a track in the lowlands near Tumpuor Village.

Species heard

- 7- Pileated Gibbon *Hylobates pileatus*: heard calling every day from 300m up to summits in Phnom Aural; less commonly heard in Phnom Tumpuor.
- 8- Red Muntjack *Muntiacus muntjak*: heard twice in Phnom Aural; on ridge at 700 m and then at Camp 2.

Tracks or signs

- 9- Gaur *Bos gaurus*: fairly fresh faeces seen near Camp 1 (400m), in semi-evergreen forest in Phnom Aural; only old track present on the plateau of Phnom Tumpuor. Footprints in mud hole as well as in a rest area full of tracks at 1300 in Phnom Aural were attributed to Banteng *Bos javanicus* by our guide (Mr Chim) but most likely belong to Gaur. Habitat and altitude are not appropriate for Banteng.
- 10- Wild Boar *Sus scrofa*: several sites with tracks in Phnom Aural and Phnom Tumpuor, in semi-evergreen and hill evergreen forest.
- 11- Civet sp. : an area on a peak of Phnom Aural (1500 masl) was littered with civet faeces
- 12- Sunbear *Ursus malayanus* or Black Bear *Ursus tibetanus*: bear faeces were found on a ridge (700 m) of pine and deciduous trees in Phnom Aural.

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

ANNEX II – LIST OF BIRDS RECORDED DURING THE EXPEDITION

No.	ENGLISH NAME	SCIENTIFIC NAME	STATUS	HABITAT	AURAL	TUMPUOR	NOTES
1	Chinese francolin	<i>Francolinus pintadeanus</i>	R	DDF	-	P	
2	Chestnut-headed partridge (GT)	<i>Arborophila cambodiana</i>	r	HE	P	C	See report 4.2.
3	Scaly-breasted partridge	<i>Arborophila chloropus</i>	R	LE, HE	P	P	Heard only
4	Red junglefowl	<i>Gallus gallus</i>	R	DW, DgF	U	U	Heard once at each site
5	[Silver pheasant]	<i>Lophura nycthemera</i>	r	HE	-	[?]	Possibly heard
6	Barred buttonquail	<i>Turnix suscitator</i>	R	DW	-	U	One observation
7	Grey-capped pygmy woodpecker	<i>Dendrocopos canicapillus</i>	r	DW	-	U	One observation
8	Lesser yellownape	<i>Picus chlorolophus</i>	r	LE	-	U	One observation
9	Black-headed woodpecker	<i>Picus erythropygius</i>	r	DW	U	U	Heard once at each site
10	White-bellied woodpecker	<i>Dryocopus javensis</i>	r	DW	-	U	Heard once
11	Common flameback	<i>Dinopium javanense</i>	r	DW	U	U	Also e.r. to Pramaoy
12	Greater flameback	<i>Chrysocolaptes lucidus</i>	r	LE, HE	C	C	Up to summits
13	Black-and-buff woodpecker	<i>Meiglyptes jugularis</i>	r	LE	-	U	One observation
14	Great slaty woodpecker	<i>Mulleripicus puerulentus</i>	r	DW	-	U	One observation
15	Lineated barbet	<i>Megalaima lineata</i>	R	DW	P	P	
16	Blue-eared barbet	<i>Megalaima australis</i>	R	LE, HE	C	C	
17	Green-eared barbet	<i>Megalaima faiostricta</i>	r	LE, HE	P	U	
18	Moustached barbet	<i>Megalaima incognita</i>	r	HE	C	C	
19	Coppersmith barbet	<i>Megalaima haemacephala</i>	R	DW	P	P	
20	Oriental pied hornbill	<i>Anthracoceros albirostris</i>	R	DW, LE	P	P	
21	Great hornbill (GNT)	<i>Buceros bicornis</i>	r	HE, LE	P	P	
22	Wreathed hornbill	<i>Aceros undulatus</i>	r	HE	P	P	Less frequent than Great
23	Common hoopoe	<i>Upupa epops</i>	R	DW	U	U	
24	Red-headed trogon	<i>Harpactes erythrocephalus</i>	R	HE	C	C	
25	Orange-breasted trogon	<i>Harpactes oreskios</i>	R	LE	P	U	
26	Indian roller	<i>Coracias benghalensis</i>	R	DW	P	U	Also e.r. to Pramaoy
27	Dollarbird	<i>Eurystomus orientalis</i>	r	DW	U	-	One record
28	Banded kingfisher	<i>Lacedo pulchella</i>	r	HE	U	U	Heard only
29	White-throated kingfisher	<i>Halcyon smyrnenensis</i>	R	DW	U	U	Also e.r. to Pramaoy
30	Chestnut-headed bee-eater	<i>Merops leschnaulti</i>	R	DW	U	-	Also e.r. to Pramaoy
31	Green bee-eater	<i>Merops orientalis</i>	r	DW?	-	-	Seen e.r. to Pramaoy
32	Blue-bearded bee-eater	<i>Nyctornis athertoni</i>	r	LE	-	U	One observation
33	Indian cuckoo	<i>Cuculus micropterus</i>	r, w ?	HE	C	C	One sighting, often heard
34	Banded bay cuckoo	<i>Cacomantis sonneratii</i>	r	DW	U	U	Heard only
35	[Asian koel]	<i>Eudynamys scolopacea</i>	R	DW	[?]	-	Possibly heard
36	Drongo cuckoo	<i>Surniculus lugubris</i>	p?, r	HE	P	P	
37	Green-billed malkoha	<i>Phaenicophaeus tristis</i>	R	HE	U	-	
38	Greater coucal	<i>Centropus sinensis</i>	R	DW	P	P	
39	Lesser coucal	<i>Centropus bengalensis</i>	r	DW	U	-	Heard once
40	Vernal hanging parrot	<i>Loriculus vernalis</i>	r	DW, HE	C	P	

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

No.	ENGLISH NAME	SCIENTIFIC NAME	STATUS	HABITAT	AURAL	TUMPUOR	NOTES
41	Red-breasted parakeet	<i>Psittacula alexandri</i>	R	DW	P	P	
42	Brown-backed needletail	<i>Hirundapus giganteus</i>	r	DW	U	-	Seen once
43	Asian palm swift	<i>Cypsiurus balasiensis</i>	R	DW, OC	U	-	Also e.r. to Pursat
44	Crested treeswift	<i>Hemiprocne coronata</i>	r	DW	P	P	Also e.r. to Pramaoy
45	Oriental bay owl	<i>Phodilus badius</i>	r	HE	C	-	
46	Oriental scops owl	<i>Otus sunia</i>	r	DW	U	-	1st Cardamom record?
47	Mountain scops owl	<i>Otus spilocephalus</i>	r	HE	P	P	
48	Collared scops owl	<i>Otus bakkamoena</i>	r	DW, HE	U	U	
49	Collared owlet	<i>Glaucidium brodiei</i>	r	LE, HE	C	C	
50	Asian barred owlet	<i>Glaucidium cuculoides</i>	r	DW	P	-	
51	Buffy fish owl	<i>Ketupa ketupu</i>	r	DW	P	P	Heard only
52	Brown hawk owl	<i>Ninox scutulata</i>	r, w	HE	-	P	
53	Brown wood owl	<i>Strix leptogrammica</i>	r	HE	-	P	
54	[Spot-bellied eagle owl]	<i>Bubo nipalensis</i>	r	HE	-	[?]	One possibly sighting, Possibly heard
55	Great eared nightjar	<i>Eurostopodus macrotis</i>	r	HE	C	-	
56	Large-tailed nightjar	<i>Caprimulgus macrurus</i>	r	DW	-	U	
57	[Indian nightjar]	<i>Caprimulgus asiaticus</i>	r	DW	[?]	-	Possibly heard
58	Spotted dove	<i>Streptopelia chinensis</i>	R	DW	C	C	
59	Red turtle dove	<i>Streptopelia tranquebarica</i>	r	DW	-	U	
60	Emerald dove	<i>Chalcophaps indica</i>	r	LE	U	-	
61	Barred cuckoo dove	<i>Macropygia unchall</i>	r	HE	P	U	
62	Blue rock pigeon	<i>Columba livia</i>	R feral	OC	-	-	Seen e.r. to Aural
63	Thick-billed green pigeon	<i>Treron curvirostra</i>	R	DW, HE?	P	P	
64	Pink-necked green pigeon	<i>Treron vernans</i>	r	DW	U	-	
65	Green imperial pigeon	<i>Ducula aenea</i>	r	DW	P	P	
66	Mountain imperial pigeon	<i>Ducula badia</i>	r	HE	C	C	
67	Red-wattled lapwing	<i>Vanellus indicus</i>	R	DW	-	U	One observation
68	White-bellied sea eagle	<i>Haliaeetus leucogaster</i>	r	DW	-	-	Single, e.r. to Pramaoy
69	Crested serpent eagle	<i>Spilornis cheela</i>	R	DW, HE	P	U	
70	Shikra	<i>Accipiter badius</i>	R	DW	P	U	Also e.r. to Pramaoy
71	Besra	<i>Accipiter virgatus</i>	r	DW	U	-	
72	[Crested goshawk]	<i>Accipiter trivirgatus</i>	r	DW	[?]	-	
73	Black baza	<i>Aviceda leuphotes</i>	r, w?	DW	-	-	Seen e.r. to Aural
74	Rufous-winged buzzard	<i>Butastur liventer</i>	R	DW	-	-	Seen e.r. to Pramaoy
75	[Grey-faced Buzzard]	<i>Butastur indicus</i>	w?	DW	-	-	[Seen e.r. to Pramaoy]
76	Rufous-bellied eagle	<i>Hieraaetus kienerii</i>	?	HE	U	-	One observation
77	Mountain hawk eagle	<i>Spizaetus nipalensis</i>	r	HE	U	-	1st Cardamom record
78	Oriental honey buzzard	<i>Pernis ptilorhynchus</i>	p, w, r?	DW	-	U	Also e.r. to Pramaoy
79	Black eagle	<i>Ictinaetus malayensis</i>	r	HE	-	U	One observation
80	Collared falconet	<i>Microhierax caerulescens</i>	r	DW	U	-	
81	White-rumped falcon	<i>Polihierax insignis</i>	r	Scrub	-	-	Seen e.r. to Aural
82	Peregrine falcon	<i>Falco peregrinus</i>	w	HE	-	U	One pair on cliff

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

No.	ENGLISH NAME	SCIENTIFIC NAME	STATUS	HABITAT	AURAL	TUMPUOR	NOTES
83	Little egret	<i>Egretta garzetta</i>	R	OC	-	-	Seen e.r. to Pursat
84	Cattle egret	<i>Bubulcus ibis</i>	r	OC	-	-	Seen e.r Pursat, Pramaoy
85	Chinese / Javan pond heron	<i>Ardeola bacchus/speciosa</i>	w	OC, DW	-	U	Seen e.r to Pursat
86	Lesser adjutant (GT)	<i>Leptoptilos javanicus</i>	r	DW	-	-	Seen e.r. to Pramaoy
87	Woolly-necked stork	<i>Ciconia episcopus</i>	r	DW	-	-	Seen e.r. to Pramaoy
88	Blue pitta	<i>Pitta cyanea</i>	r	HE	C	P	
89	Long-tailed broadbill	<i>Psarisomus dalhousiae</i>	r	HE	C	C	
90	[Dusky broadbill]	<i>Corydon sumatranus</i>	r	HE	[?]	-	Possibly heard
91	Silver-breasted broadbill	<i>Serilophus lunatus</i>	r	HE	P	P	
92	Asian fairy bluebird	<i>Irena puella</i>	R	HE	C	C	
93	Golden-fronted leafbird	<i>Chloropsis aurifrons</i>	R	DW	U	-	
94	Blue-winged leafbird	<i>Chloropsis cochinchinensis</i>	r	HE, LE	P	U	
95	Brown shrike	<i>Lanius cristatus</i>	R	OC, DW	U	-	Seen e.r. to Aural
96	Burmese shrike	<i>Lanius colluriooides</i>	r	DW	U	U	
97	Eurasian jay	<i>Garrulus glandarius</i>	r	DW	P	P	
98	Indochinese green magpie	<i>Cissa hypoleuca</i>	r	HE	U	P	
99	Red-billed blue magpie	<i>Urocissa erythrorhyncha</i>	r	DW	U	-	Also e.r. to Pursat
100	Rufous treepie	<i>Dendrocitta vagabunda</i>	?	Scrub, DW	-	-	Seen e.r. Aural, Pursat
101	Racket-tailed treepie	<i>Crypsirina temia</i>	R	DW	U	-	One observation
102	Black-naped oriole	<i>Oriolus chinensis</i>	W, r	DW, HE	U	P	
103	Black-hooded oriole	<i>Oriolus xanthornus</i>	r	DW	U	-	
104	Silver oriole (GT)	<i>Oriolus mellianus</i>	w	HE	-	U	See report 4.2.
105	Black-winged cuckooshrike	<i>Coracina melaschistos</i>	W	HE	U	-	One observation
106	Large cuckooshrike	<i>Coracina macei</i>	r	DW	P	P	
107	Indochinese cuckooshrike	<i>Coracina polioptera</i>	r	DW	P	P	
108	Ashy minivet	<i>Pericrocotus divaricatus</i>	p, w	DW	P	P	
109	Swinhoe's minivet	<i>Pericrocotus cantonensis</i>	w, p?	HE, LE	[?]	P	
110	Small minivet	<i>Pericrocotus cinnamomeus</i>	r	DW	-	P	
111	Scarlet minivet	<i>Pericrocotus flammeus</i>	R	DW	U	P	
112	Grey-chinned minivet	<i>Pericrocotus solaris</i>	r	HE	C	C	
113	Bar-winged flycatcher-shrike	<i>Hemipus picatus</i>	r	HE, LE	P	U	
114	White-browed Fantail	<i>Rhipidura aureola</i>	r	DW	-	U	1st Cardamom record
115	White-throated fantail	<i>Rhipidura albicollis</i>	r	HE	C	C	
116	Ashy drongo	<i>Dicurus leucophaeus</i>	r, W	DW, HE	P	P	
117	Bronzed drongo	<i>Dicurus aeneus</i>	R	HE, DW	P	P	
118	Lesser racket-tailed drongo	<i>Dicurus remifer</i>	r	HE	C	C	
119	Spangled drongo	<i>Dicurus hottentotus</i>	r	DW	C	C	
120	Black drongo	<i>Dicurus macrocercus</i>	r	OC	C	C	Seen e.r. Aural, Pursat
121	Greater racket-tailed drongo	<i>Dicurus paradiseus</i>	R	DW	P	U	
122	Black-naped monarch	<i>Hypothymis azurea</i>	R	DW, HE	P	U	
123	Asian paradise flycatcher	<i>Terpsiphone paradisi</i>	r	HE	U	-	One observation
124	Common iora	<i>Aegithina tiphia</i>	r	DW	P	P	Also e.r. to Pramaoy
125	Large woodshrike	<i>Tephrodornis gularis</i>	r	DW, HE	U	U	

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

No.	ENGLISH NAME	SCIENTIFIC NAME	STATUS	HABITAT	AURAL	TUMPUOR	NOTES
126	White-throated rock thrush	<i>Monticola gularis</i>	p, w?	LE	U	-	One observation
127	Blue rock thrush	<i>Monticola solitarius</i>	p?, W	Garden	-	-	In Pursat
128	Blue whistling thrush	<i>Myophonus caeruleus</i>	r	HE	-	P	
129	Orange headed thrush	<i>Zoothera ctrina</i>	r	HE	P	P	
130	Eye-browed thrush	<i>Turdus obscurus</i>	p, w	HE	-	U	
131	Lesser shortwing	<i>Brachypteryx leucophrys</i>	r	HE	-	U	One observation
132	Asian brown flycatcher	<i>Muscicapa dauurica</i>	p, W	DW	-	U	One observation
133	Large niltava	<i>Niltava grandis</i>	r	HE	U	U	
134	Fujian niltava	<i>Niltava davidi</i>	?w, p	HE	-	P	
135	White-tailed robin	<i>Myiomela leucura</i>	r	HE	P	C	
136	Red-throated flycatcher	<i>Ficedula parva</i>	p, W	Garden	-	-	In Pursat
137	Mugimaki flycatcher	<i>Ficedula mugimaki</i>	w	HE	-	P	
138	Verditer flycatcher	<i>Eumyias thalassina</i>	r	HE	U	U	
139	Hill blue flycatcher	<i>Cyornis banyumas</i>	?	HE	-	C	
140	Blue-throated flycatcher	<i>Cyornis rubeculoides</i>	?	HE	-	C	
141	Tickell's blue flycatcher	<i>Cyornis tickelliae</i>	r	LE	U	-	One observation (bamboo)
142	Oriental magpie robin	<i>Copsychus saularis</i>	R	Town	-	-	In Pursat
143	White-rumped shama	<i>Copsychus malabaricus</i>	r	DW, LE	P	P	
144	Siberian blue robin	<i>Luscinia cyane</i>	w	DW, HE	-	P	
145	Slaty-backed forktail	<i>Enicurus schistaceus</i>	r	HE, LE	P	P	
146	Green cochoa (GNT)	<i>Cochoa viridis</i>	r	HE	U	-	Two contact (heard)
147	Chestnut-tailed starling	<i>Sturnus malabaricus</i>	p,w	DW	-	U	One observation
148	Black-collared starling	<i>Sturnus nigricollis</i>	r	OC, DW	U	-	Also e.r. to Aural
149	Common myna	<i>Acridotheres tristis</i>	R	OC, towns	-	-	Seen e.r. Pursat, Pramaoy
150	White-vented myna	<i>Acridotheres grandis</i>	R	OC	-	-	Seen e.r. to Aural
151	Hill myna	<i>Gracula religiosa</i>	r	DW	P	P	
152	Chestnut-bellied nuthatch	<i>Sitta castanea</i>	r	DW	-	P	
153	Velvet-fronted nuthatch	<i>Sitta frontalis</i>	r	DW, HE	P	P	
154	Barn swallow	<i>Hirundo rustica</i>	P,W	OC, towns	-	-	e.r. Aural, Pursat, Pramaoy
155	[Red-rumped / Striated swallow]	<i>Hirundo daurica/striolata</i>	w	LE	-	[?]	Unconfirmed ID
156	Asian house martin	<i>Delichon dasypus</i>	w	DW, HE	P	-	Also e.r. to Pramaoy
157	Sooty-headed bulbul	<i>Pycnonotus aurigaster</i>	R	DW	U	P	Also e.r. to Pramaoy
158	Stripe-throated bulbul	<i>Pycnonotus finlaysoni</i>	r	LE	[?]	P	
159	Yellow-vented bulbul	<i>Pycnonotus goiavier</i>	R	OC, towns	-	-	e.r. Aural, Pramaoy;Pursat
160	Black-crested bulbul	<i>Pycnonotus melanicterus</i>	r	LE, HE	P	P	
161	Ochraceous bulbul	<i>Alophoixus ochraceus</i>	R	LE, HE	P	P	
162	Grey-eyed bulbul	<i>Iole propinqua</i>	r	LE, HE	P	P	
163	Black bulbul	<i>Hypsipetes leucocephalus</i>	r, w	DW (Pine)	U	-	One observation
164	Mountain bulbul	<i>Hypsipetes mcclllandii</i>	R	HE	C	C	
165	Rufescent prinia	<i>Prinia rufescens</i>	r	DW	P	-	

S.V.C. CARDAMOM EXPEDITION REPORT - Feb 2006

No.	ENGLISH NAME	SCIENTIFIC NAME	STATUS	HABITAT	AURAL	TUMPUOR	NOTES
166	Grey-brested prinia	<i>Prinia hodgsonii</i>	?r	DW	P	-	
167	Brown prinia	<i>Prinia polychroa</i>	r	DW	P	P	
168	Oriental white eye	<i>Zosterops palpebrosus</i>	r	HE	U	P	
169	Grey-bellied tesia	<i>Tesia cyaniventer</i>	r	HE	-	U	
170	Dark-necked tailorbird	<i>Orthotomus atrogularis</i>	r	LE	P	P	
171	Common tailorbird	<i>Orthotomus sutorius</i>	R	DW, towns	U	U	Also in Pursat
172	White-tailed leaf warbler	<i>Phylloscopus davisoni</i>	R	HE	C	C	
173	Yellow-browed warbler	<i>Phylloscopus inornatus</i>	p, W	HE	P	P	
174	Two-barred greenish warbler	<i>Phylloscopus plumbeitarsus</i>	W	HE	P	[?]	
175	Arctic warbler	<i>Phylloscopus borealis</i>	w, p?	HE	-	U	One observation
176	Sulphur-breasted Warbler	<i>Phylloscopus ricketti</i>		HE	-	U	One observation
177	Chestnut-crowned warbler	<i>Seicercus castaniceps</i>	?r	HE	U	U	
178	Plain-tailed Warbler	<i>Seicercus soror</i>	w	HE	-	P	
179	Cambodian laughingthrush	<i>Garrulax ferrarius</i>	r	HE	C	P	
180	White-crested laughingthrush	<i>Garrulax leucolophus</i>	R	DW, LE	C	P	Also e.r. to Pramaoy
181	Lesser necklaced laughingthrush	<i>Garrulax monileger</i>	r	HE, LE	P	-	
182	Puff-throated babbler	<i>Pellorneum ruficeps</i>	R	DW, LE	P	-	
183	Scaly-crowned babbler	<i>Malacopteron cinereum</i>	r	HE	U	[?]	One confirmed observ.
184	White-browed scimitar babbler	<i>Pomathorinus schisticeps</i>	r	HE	C	C	
185	Streaked wren babbler	<i>Napothera brevicaudata</i>	r	HE	C	C	
186	Pygmy wren babbler	<i>Pnoepyga pusilla</i>	r	HE	U	-	One observation
187	Striped tit babbler	<i>Macronus gularis</i>	R	DW, LE, HE	C	P	
188	White-browed shrike babbler	<i>Pteruthius flaviscapis</i>	r	HE	P	U	
189	Blue-winged minla	<i>Minla cyanouroptera</i>	r	HE	U	U	
190	White-bellied yuhina	<i>Yuhina zantholeuca</i>	R	HE, LE	C	C	
191	Thick-billed flowerpecker	<i>Dicaeum agile</i>	r	LE	U	U	
192	Fire-breasted flowerpecker	<i>Dicaeum ignipectus</i>	r	LE	U	-	One observation
193	Brown-throated sunbird	<i>Anthreptes malacensis</i>	r	OC	-	-	Heard e.r. to Pursat
194	Ruby-cheeked sunbird	<i>Anthreptes singalensis</i>	R	LE	U	U	
195	Black-throated sunbird	<i>Aethopyga saturata</i>	r	HE	C	C	
196	Purple sunbird	<i>Nectarinia asiatica</i>	R	DW	U	P	
197	Olive-backed sunbird	<i>Nectarinia jugularis</i>	R	DW	-	U	One observation
198	Little spiderhunter	<i>Arachnothera longirostra</i>	r	LE	U	-	One observation
199	Grey wagtail	<i>Motacilla cinerea</i>	w	LE (stream)	-	U	One observation
200	Eurasian tree sparrow	<i>Passer montanus</i>	R	Towns	-	-	In Pursat
201	Plain-backed sparrow	<i>Passer flaveolus</i>	r	OC	-	-	In Pursat

KEY TO THE TABLE

Species order and nomenclature follow Robson (2000)

Status (follows FFI list)

R / r = common / uncommon resident

W / w = common / uncommon winter visitor

p = passage migrant

? = status unclear

Habitat

DW = deciduous woodlands

LE = lowland semi-evergreen forest

HE = hill evergreen forest

OC = Open countryside

Record codes

U = uncommon (1-2 contact)

C = common (daily contact)

P = present (nor U neither C)

[?] = provisional record

Note that the codes reflect more contact rate and survey effort in respective habitat than actual abundance. Therefore, they give a fairly good indication of relative abundance for easily-detected species occurring in hill evergreen forest only. For and secretive and less vocal bird species, as well as for species found in other habitats (deciduous woodlands, lowland semi-evergreen forest), they merely indicate species presence or absence.

Notes

e.r. = en route

Reptiles

- 1- Modest Keelback *Amphiesma modesta*: three individuals were found along stream in hill evergreen or lowland semi-evergreen forest. A 30 cm specimen at Camp 1 (500 m), and a 60 cm specimen between Camp 2 and 3 (800 m) in Phnom Aural; one (40 cm) at the camp site on Tumpuor plateau.
- 2- Flat-tailed Gecko *Cosymbotus platyurus*: numerous in Pursat town.
- 3- Spiny-tailed Gecko *Hemidactylus frenatus* : numerous in Pursat town and in Pramoy Village
- 4- Tockay *Gekko gekko*: common in villages and town; one seen on a tree in deciduous woodland off Tumpuor Leu village.
- 5- Cardamom Banded Gecko *Cyrtodactylus intermedius*: four at Camp 2 (1000 m) and three at Camp 3 (about 500 m) in Phnom Aural.
- 6- Siamese Leaf-toed Gecko *Phyllodactylus siamensis*: one on the sandy track in Tumpuor Leu village. On the ground, with uplifted tail.
- 7- Garden Fence Lizard *Calotes versicolor*: one along Tumpuor stream (lowlands).
- 8- Many-lined Sun Skink *Mabuya multifasciata*: one in leaf-litter of Camp 2 in Phnom Aural.
- 9- Speckled Leaf-litter Skink *Scincella reveesi*: regularly seen along forest tracks.
- 10- Streamside Skink *Sphenomorphus maculatus*: common along streams with rocks in Phnom Aural and Phnom Tumpuor

Amphibians

- 11- Rana motenseni: this species was found common on stream in hill evergreen forest
- 12- Fergevaria lymnocharis: common in lowlands, ricefields.
- 13- Microhyla sp.: three species are likely to occur: *M. ornata*, *M. berdmorei*, *M. pulchra*. One comparatively larger type was found common in leaf-litter in hill evergreen forest. Several were present in a pagoda pond in Pursat. Numerous were found hidden and foraging under ricefield hay.
- 14- Limnonectes sp.: found in Camp 2 along stream in Phnom Aural
- 15- Limnonectes 'macrognathus': found in Camp 2 in Phnom Aural and Camp 1 in Phnom Tumpuor.

SVC CARDAMOM EXPEDITION REPORT - Feb 2006

Order	Family							
Scolopendrida	Sclopendridae							
Psocoptera	Psocidae							
Homoptera	Lopopidae							
Hemiptera	Chrysididae	Scutelleridae	Cercopidae	Pentatomidae	Naucoridae	Nepidae	Notonectidae	Gerridae
	Acanthosomatidae	Cicadidae	Pyrrhocoridae	Reduviidae				
Diptera	Asilidae	Tephritidae	Dolichopodidae	Diopsidae	Hybotidae	Chloropidae	Sepsidae	Syrphidae
	Tipulidae	Mycetophilidae	Acroceridae					
Hymenoptera	Tenthredinidae	Meliponinae	Eumenidae	Chrysidae	Lepidotrigona	Vespidae		
Coleoptera	Elateridae	Cucujidae	Scarabaeidae	Passalidae	Pyrochroidae	Meloidae	Coccinellidae	Cleridae
	Cerambycidae							
Scutigerida	Scutigerae							
Acari	Trombidiidae	Ixodidae						
Raphidioptera	Raphidiidae							
Blattodea	Blattidae							
Dermaptera	Forficulidae							
Blattodea								
Orthoptera								