Recent literature from Cambodia

This section summarizes recent scientific publications concerning Cambodian biodiversity and natural resources. The complete abstracts of most articles are freely available online (and can be found using Google Scholar or other internet search engines), but not necessarily the whole article. Lead authors may be willing to provide free reprints or electronic copies on request and their email addresses, where known, are included in the summaries below.

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New species & taxonomic reviews

Bayarsaikhan, U., Im K.-H. & Bae Y.-S. (2019) Two new species and a newly recorded species of the genus *Stictane* Hampson (Lepidoptera, Erebidae, Arctiinae) from Cambodia. *Zootaxa*, **4686**, 253–263.

The authors describe two species of moth new to science (*Stictane heppneri* sp. nov. and *S. transversana* sp. nov.) based on specimens collected in the Koh Kong, Kampot and Siem Reap provinces. They also document the first record of *S. obscura* in Cambodia and provide an identification key for *Stictane* species in Cambodia, with figures of adults and genitalia. Author: baeys@inu.ac.kr

Grismer, L.L., Wood, P.L., Quah, E.S.H., Anuar, S., Poyarkov, N.A., Neang T., Orlov, N.L., Thammachoti, P. & Hun S. (2019) Integrative taxonomy of the Asian skinks *Sphenomorphus stellatus* (Boulenger, 1900) and *S. praesignis* (Boulenger, 1900) with the resurrection of *S. annamiticus* (Boettger, 1901) and the description of a new species from Cambodia. *Zootaxa*, **4683**, 381–411.

The authors revise the taxonomy of three species of *Sphenomorphus* skinks based on phylogenetic, morphological and colour pattern data and describe one species new to science from Phnom Chi in Prey Lang Wildlife Sanctuary: *S. preylangensis* sp. nov. Author: lgrismer@lasierra.edu

Hosoishi S. (2019) A new subterranean *Crematogaster* with one ommatidium from Cambodia, based on morphology and DNA (Hymenoptera, Formicidae). *Acta Entomologica*, **59**, 507–511.

The author describes a new species of mymicine ant to science based on two worker specimens collected in leaf litter in lowland forest in Koh Kong Province. The new species is named *Crematogaster monocula* and is morphologically similar to *C. masukoi* of the *C. biroi* group. Author: hosoishi@gmail.com

Jager, P. (2019) *Selenops ef* sp. nov. (Araneae: Selenopidae) from Cambodia: first record from an Asian cave. *Arachnology*, **18**, 245–247.

The author describes a species of spider new to science (*Selenops ef* sp. nov.) from Battambang Province, which represents the first record of the genus from a cave in Asia. A distribution map is given for *Selenops* species in Asia and the cave-dwelling habit of the new species is discussed. Author: peter.jaeger@senckenberg.de

Ko J.-H., Lee T.-G., Bayarsaikhan, U., Park B.-S. & Bae Y.-S. (in press) Review of genus *Cirrhochrista* Lederer, 1863 (Lepidoptera: Crambidae: Spilomelinae) from Cambodia, with the first description of the male of *Cirrhochrista fuscusa*. *Journal of Asia-Pacific Biodiversity*. DOI 10.1016/j.japb.2019.09.008

The authors review the genus *Cirrhochrista* in Cambodia, which comprises six newly-recorded species. Photographs of adults and genitalia are provided, with re-descriptions, collection data and information on the distribution and host plants of each species. Author: baeys@inu.ac.kr

Kosterin, O.E. (2019) Description of a female and variation of *Microgomphus alani* Kosterin, 2016 (Odonata: Gomphidae) in Cambodia, with a note on sexual dimorphism in *Microgomphus* spp. *Zootaxa*, **4701**, 276–290.

The author describes morphological variation in new specimens of the recently discovered *Microgomphus alani* in Cambodia, namely a male and two females from Phnom Kulen (Siem Reap Province) and five females and one male from Mondulkiri Province. Author: kosterin@bionet.nsc.ru

Kovarik, F. & Stahlavsky, F. (2019) Revision of the genus *Reddyanus* from Southeast Asia, with description of five new species from Cambodia, Malaysia, Thailand and Vietnam (Scorpiones: Buthidae). *Euscorpius—Occasional Publications in Scorpiology*, **295**, 1–45.

The authors describe five species of *Reddyanus* scorpion new to science, including two from Cambodia: *R. rolciki* sp. nov. and *R. schwotti* sp. nov. Details of karyotypes are presented alongside descriptions of external morphology. An identification key and distribution map

for the 14 species of *Reddyanus* recognised by the authors in Southeast Asia are also included.

Vermeulen, J.J., Luu H.T., Theary K. & Anker, K. (2019) Land snail fauna of the Mekong Delta limestone hills (Cambodia, Vietnam): *Notharinia* Vermeulen, Phung et Trung, 2007, and a note on *Plectostoma* A. Adams, 1865 (Mollusca: Gastropoda: Caenogastropoda: Diplommatinidae). *Folia Malacologica*, **27**, 167–177.

The authors present a revision of the mollusc genus *Notharinia*, which includes 10 species that are endemic to limestone hills on the western flank of the Mekong River delta in Vietnam and Cambodia. Seven of the 10 species are described as new to science, including four from Cambodia: *N. constricta* sp. nov., *N. lyostoma* sp. nov., *N. soluta* sp. nov., and *N. stenobasis* sp. nov. Author: jk.artandscience@gmail.com

Biodiversity inventories

Kosterin, O.E. (2019) Occasional photographic records of butterflies (Lepidoptera, Hesperioidea and Papilionoidea) in Cambodia. 2. Ratanakiri and Mondulkiri Provinces of Eastern Cambodia, 2013–2018. *Acta Biologica Sibirica*, **5**, 21–37.

The author presents opportunistic records of 123 butterfly species (including five provisionally identified species) from 33 localities in the Ratanakiri and Mondulkiri provinces between 2013 and 2018. These include the first records for Cambodia of 19 butterfly species and one subspecies. Author: kosterin@bionet.nsc.ru

Species ecology & status

Heinrich, S., Ross, J.V., Gray, T.N.E., Delean, S., Marx, N. & Casseya, P. (2020) Plight of the commons: 17 years of wildlife trafficking in Cambodia. *Biological Conservation*. DOI 10.1016/j.biocon.2019.108379

The Wildlife Rapid Rescue Team (WRRT) of the Cambodian Forestry Administration has combatted wildlife trafficking in Cambodia since 2001. The authors analysed confiscation records of the WRRT for 2001–2018 to determine compositional trends in trafficked species and identify conservation gaps. Birds comprised the highest number of animals confiscated, although reptiles accounted for the greatest number of confiscation incidents. The authors show that Cambodia contributes substantially to the bird trade and may be an underreported element of the Asian songbird crisis. Author: sarah.heinrich@adelaide.edu.au

Coasts, wetlands & aquatic resources

Baird, I.G. & Green, W.N. (2019) The Clean Development Mechanism and large dam development: contradictions associated with climate financing in Cambodia. *Climatic Change*. DOI 10.1007/s10584-019-02621-4

The Clean Development Mechanism (CDM) of the Kyoto Protocol was designed to reduce greenhouse gas emissions and promote sustainable development, but has financed hydropower dams that have caused serious environmental and social impacts. The authors consider the case of the Lower Sesan 2 (LS2) dam in northeast Cambodia. While the LS2 has not received funding from the CDM, it could be registered to receive post-construction financing. The authors highlight an apparent lack of improvements in critical areas of the CDM despite years of criticisms and suggest there are framing and structural issues which make reform difficult. This is timely because the CDM is scheduled to end in 2020, after which it will be replaced by a new and currently unspecified climate change financing mechanism. Author: ibaird@wisc.edu

Fiorella, K.J., Bageant, E.R., Kim M., Sean V., Try V., MacDonell, H.J., Baran, E., Kura Y., Brooks, A.C., Barrett, C.B. & Thilsted, S. (2019) Analyzing drivers of fish biomass and biodiversity within community fish refuges in Cambodia. *Ecology and Society*, **24**, 18.

Freshwater systems are shaped by site-specific characteristics, environmental change and annual fluctuations, and the actions of resource users and managers. The authors assessed the influence of these factors on the fishery productivity and biodiversity of 40 rice field fisheries (community fish refuges) over three years and found that seasonal and site-specific effects relate strongly to biomass and species richness patterns within these systems. They also found an association between biomass and biodiversity and some elements of governance capacity building. Their findings suggest that management actions for rice field fisheries that are tailored and responsive to local contexts may be most appropriate given the strong interannual and site-specific drivers.

Pool, T., Elliott, V., Holtgrieve, G., Aria, M., Altman, I., Kauman, L., McCann, K., Fraser, E.D.G., Tudesque, L., Chevalier, M., Grenouillet, G., Chea R., Lek S., McMeans, B., Cooperman, M., Chheng P., Hannah, L., Miller, B., Chuanbo G. & So N. (2019) Fish assemblage composition within the floodplain habitat mosaic of a tropical lake (Tonle Sap, Cambodia). *Freshwater Biology*. DOI 10.1111/fwb.13391

Effective conservation of flood–pulse catchments requires an understanding of how habitat heterogeneity is linked to biodiversity patterns in these systems. The authors evaluated whether mesohabitat-scale (1–5 km) factors throughout the floodplains of the Tonle Sap Lake

affect fish assemblages temporally and spatially. They conclude that fish assemblage structure and floodplain mesohabitat use within the lake may depend strongly upon maintaining the natural flow regime. Author: poolt@seattleu.edu

Forests & forest resources

Chim K., Tunnicliffe, J., Shamseldin, A. & Ota T. (2019) Land use change detection and prediction in upper Siem Reap River, Cambodia. *Hydrology*. DOI 10.3390/hydrology6030064

The Siem Reap River has played an important role in maintaining the Angkor temple complex and livelihoods of people in the basin since the 12th century. As land use in the surrounding watershed has changed in recent decades and possibly influenced the river, the authors reconstructed annual deforestation patterns from 1988 to 2018 and explored land use scenarios 40 and 80 years into the future. Their results suggest that forest cover in the watershed has declined by 1.22% annually over the last three decades, and that a continued downward trend in forest cover can be expected in the future. Author: chimkosal@yahoo.com

Coad, L., Lim S. & Nuon L. (2019) Wildlife and Livelihoods in the Cardamom Mountains, Cambodia. *Frontiers in Ecology and Evolution*, **296**, 1–18.

The authors assessed the use of wild meat and fish in three village communities in the northern Cardamom Mountains through household interviews and group discussions. Their results suggest that >80% of households hunt and >90% fish, but also suggest that arable farming provides the bulk of incomes. The authors conclude that while wildlife-friendly farming initiatives may support livelihoods and promote conservation, continued declines in biodiversity are likely without stricter enforcement of wildlife trade laws in urban areas and reduction of demand for wildlife products in consumer countries. Author: lauren.coad@me.com

Kaura, M., Arias, M.E., Benjamin, J.A., Oeurng C. & Cochrane, T.A. (2019) Benefits of forest conservation on riverine sediment and hydropower in the Tonle Sap Basin, Cambodia. *Ecosystem Services*. DOI 10.1016/j.ecoser.2019.101003

Hydropower development has accelerated in the Mekong region and recent deforestation rates in Cambodia are among the world's highest. Forest protection represents a service to hydropower because forest loss accelerates erosion which increases river sediments and decreases hydropower production. The authors evaluated four proposed medium-size hydropower dams and found that these could lose 60–100% of their storage capacity over 120 years at current deforestation rates. They suggest that their approach is transferable to dams in other regions where hydropower development is accelerating and ecosystem services from surrounding watersheds require quantification. Author: mearias@usf.edu

Veettil, B.K. & Ngo X.Q. (2019) Mangrove forests of Cambodia: recent changes and future threats. *Ocean and Coastal Management*, **181**, 1–7.

Mangrove forests are important for coastal area protection, ecosystem services and other socio-economic purposes. The authors analysed satellite data to determine changes in mangrove cover in Cambodia and estimate that 42% of mangrove cover was lost between 1989–2017 in the Koh Kong, Kampot, Preah Sihanoukville provinces. However, they also suggest that mangrove loss has decreased in recent years due to reforestation, banning of illegal charcoal production and deactivation of non-profitable aquaculture ponds. Author: bijeeshkozhikkodanveettil@duytan.edu.vn

The Recent Literature section was compiled by Neil Furey, with contributions from Oleg Kosterin and Jaap Vermeulen.

