Short Communication

Expansion of the range of *Eupatorus siamensis* (Castelnau, 1867) (Coleoptera: Scarabaeidae: Dynastinae) in Cambodia

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The Dynastinae Macleay, 1819 is one of the largest subfamilies in the Scarabaeidae (Coleoptera). The subfamily includes about 1,500 species in 225 genera (Beutel & Leschen, 2016) and over 200 species have been described from Southeast Asia (Pathomwattananurak *et al*., 2019). Within the region, the Dynastinae fauna of Thailand is the most studied with 32 species recorded (Pathomwattananurak *et al*., 2019), whereas aside from collection records gathered at the end of the 19th century and scattered taxonomic revisions (Jameson & Drumont, 2013), in-depth work has yet to be conducted in Cambodia.

Due to their large size and extravagant male ornamentation, species within the genus *Eupatorus* Burmeister, 1847 are among the most remarkable rhinoceros beetles in Southeast Asia. The genus is widely distributed in Asia and Oceania and represented by eight species, namely: *Eupatorus becarii* (Gestro, 1876), *E. birmanicus* Arrow, 1908, *E. endoi* Nagai, 1999, *E. gracilicornis* Arrow, 1908, *E. hardwickei* (Hope, 1831), *E. pyros* Prandi & Grossi, 2021, *E. siamensis* (Castelnau, 1867) and *E. sukkiti* Miyashita & Arnaud, 1996. These beetles are generally found in bamboo forests (Moskalenko, 2017), where the larvae develop in the soil and feed on decaying wood for about a year. Adults are usually active at the end of the rainy season from August to November, feed on nectar, plant sap and rotten fruits and live for about six months (Moskalenko, 2017).

Historically, only *E. gracillicornis*, the most common species in the genus and widely distributed from India to China and throughout Southeast Asia, was recorded in Cambodia (Moskalenko, 2017). More recently however, *E. siamensis* has been reported along the eastern region of the Mekong River in Cambodia, although information on its precise locations was not provided (Prandi & Grossi, 2021). *Eupatorus siamensis* is a large beetle (male size ca. 43–75 mm) and was originally described from Siam (present day Thailand). The type specimen (accession no. MNHN-EC4171) is deposited in the Oberthür Collection in the Museum d'Histoire Naturelle de Paris. The species is known from the Khao Yai, Kalasin, Chaiyaphum, Loei, Mae Hong Son and Phetchabun provinces in Thailand (Ek-Amnuay, 2008; Thinh & Tru, 2008; Pathomwattananurak *et al*., 2019) and is also reported from Vietnam (Gia Lai province) and Laos (no province specified) (Thinh & Tru, 2008). While the presence of *E. siamensis* seems credible in Vietnam and Laos, we are not aware of any specimens deposited in museum collections and so these records may need further confirmation.

We present herein a range expansion for *E. siamensis* in Cambodia. Two large male specimens (60 and 65 mm) were collected in the Chambok Community-Based Eco-

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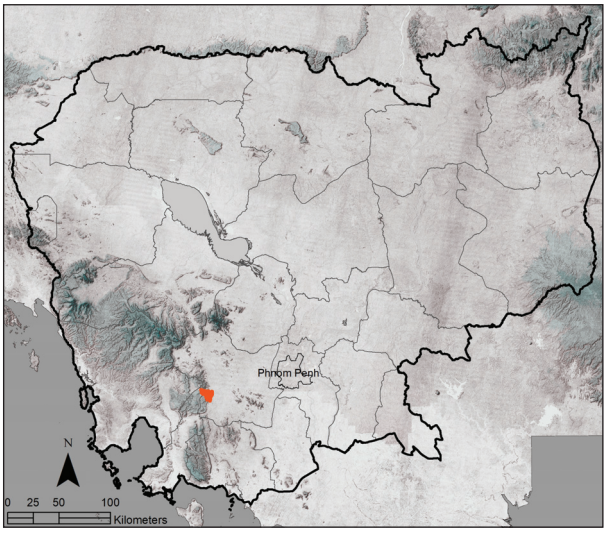

Fig. 1 Location of Chambok Community-Based Eco-Tourism Site (red polygon) in Kampong Speu Province, Cambodia.

Fig. 2 Dorsal (above) and lateral habitus of *Eupatorus siamensis* (Castelnau, 1867) from Chambok Community-Based Eco-Tourism Site.

Fig. 3 Live male of *Eupatorus siamensis* (Castelnau, 1867) observed 4 km west of Kampot (© Greg Allen).

Tourism Site (CBET) in Kampong Speu Province (Fig. 1). These were collected using a UV-light trap in semi-evergreen forest during entomological training sessions focusing on Coleoptera as part of a collaboration between the Cambodian Entomology Initiatives (CEI) and the Illinois Natural History Survey in 2018. Our specimens of the species are distinguished from other members of the genus by their glabrous dorsa, their two divergent and non-spatulate thoracic horns, dark chestnut habitus, and the shape of their aedeagus (Prandi & Grossi, 2021) (Fig. 2).

The observation of *E. siamensis* was made in the community protected area of the CBET, which forms part of the Cardamom Mountains. The CBET occupies a total area of 8,257 ha and borders Kirirom National Park (Lonn, 2013). Vegetation at the site includes bamboo forests, semi-evergreen forests and grasslands with deciduous forests (Chhorn *et al.*, 2020; Sin *et al.*, 2020). Given their similar vegetation patterns, it is possible that the species occurs throughout the Cardamom and Damrei mountain ranges. Furthermore, observations of *E. siamensis* have been made by nature enthusiasts in Phnom Kulen National Park, Phnom Bok and around Kampot (Allen, 2019) (Fig. 3). As such, the distribution of this insect may be greater than expected and it could potentially occur in most Cambodian dipterocarp forests that include areas of bamboo.

This new record highlights the need for entomological studies and conservation of rare or endangered invertebrates in Cambodia, as even the largest and more noticeable insects such as *E. siamensis* are poorly documented. Fortunately, studies initiated by the CEI in 2015 are beginning to reduce this knowledge gap.

The specimens have been deposited in the collection of the CEI and include the following information: two males (accession no. CEI-004124, CEI-004125) "Cambodia, Kampong Speu Province, Chambok Ecotourism, 11°22.31.1 N, 104°06.47.3 E, 111 m above sea level, 04.X.2018, Phauk, McElrath, CEI team & BIOs stu., CA0106, Light trap, S.N., Forest, rain forest, Eco-tour".

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References

Allen, G. (2019) [*Live Image of Eupatorus siamensis]*. Https://www.facebook.com/photo/?fbid=2107271872902211&set=pcb.10157095789443393 [Accessed 6 June 2021].

Beutel, R.G. & Leschen, R.A.B. (2016) *Handbook of Zoology. Anthropoda: Insecta. Coleoptera, Beetles. Morphology and Systematics (Archostemata, Adephaga, Myxophaga, Polyphaga Partim)*. Volume 1. Walter de Gruyter, Berlin, Germany.

Chhorn S., Chan B., Sin S., Doeurk B., Chhy T., Phauk S. & Sor R. (2020) Diversity, abundance and habitat characteristics of mayflies (Insecta: Ephemeroptera) in Chambok, Kampong Speu Province, southwest Cambodia. *Cambodian Journal of Natural History*, **2020**, 61–68.

Ek-Amnuay, P. (2008) *Beetles of Thailand*. Siam Insect Zoo, Bangkok, Thailand.

Jameson, M.L. & Drumont, A. (2013) Aroid scarabs in the genus *Peltonotus* Burmeister (Coleoptera, Scarabaeidae, Dynastinae): key to species and new distributional data. *Zookeys*, **320**, 63–95.

Lonn P. (2013) Can community-based ecotourism improve local livelihoods? A case study of Chambok community-based ecotourism, southwest Cambodia. *Cambodia Development Review*, **17**, 1–7.

Moskalenko, S. (2017) A new subspecies of *Eupatorus gracilicornis* Arrow, 1908 from Southern Vietnam (Coleoptera, Scarabaeidae, Dynastinae). *Insecta Mundi*, **0580**, 1–10.

Pathomwattananurak, W.N., Jeenthong, T. & Tasen, W. (2019) To the knowledge of the subfamily Dynastinae (Coleoptera: Scarabaeidae) from Thailand. *Far Eastern Entomologist*, **393**, 1–10.

Prandi, M. & Grossi, P.C. (2021) A new species of *Eupatorus* Burmeister, 1847 related to *Eupatorus birmanicus* Arrow, 1908 from southwestern China (Coleoptera: Scarabaeidae: Dynastinae). *Zootaxa*, **4966**, 029–040.

Sin S., Chhorn S., Doeurk B., Hak K., Ith S., Phauk S. & Sor R. (2020) Diet preferences of insectivorous bats (Mammalia: Chiroptera) in Chambok, Kampong Speu Province, Cambodia. *Cambodian Journal of Natural History*, **2020**, 69–77.

Thinh T.H. & Tru H.V. (2008) Phân bò càc loài côn trùng cò già tri bào tòn ò trung bô và tây nguyen [Insects of conservation concern from Central Vietnam]. Hôi nghi côn trùng hoc toàn quòc làn thu 6- Hanoi, 2008 [In Vietnamese].

