

Research Article



Coeliccia vacca Laidlaw, 1932 (Odonata: Zygoptera: Platynemididae) A Data Deficient Potentially Threatened Species

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Abstract | *Coeliccia vacca* Laidlaw has been added to the Odonata fauna of Pakistan by reporting it from three mountainous spots in sub Himalayan hill tracts of Pakistan. It is a data deficient, potentially threatened species whose habitat and ecology was never known. To date, there is no information available for its male and immature stages. It is second species for the genus to be recorded from Pakistan. Distributional details along with important taxonomic characters and habitat information is discussed in detail to facilitate readers of this document. A key to the known species of *Coeliccia* from Pakistan is also provided. A need to conduct further surveys in whole hill belt is highly felt with a view to get more information especially for its male and naiads.

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Introduction

Family Platynemididae is a large family of sub order Zygoptera with 26 known genera and 224 worldwide species (Schorr and Paulson, 2019). Among these, genus *Coeliccia* is widely distributed in Asia representing 72 named species (Subramanian, 2009). It has widespread distribution and is reported from N. E. India, Burma, Philippines, Soudic Archipelago, Malaysia, Indo China Formosa, Borneo (Fraser, 1933), Bangladesh, Nepal (Shigeru, 2000) and China (Wilson et al., 2008). Among neighboring countries to Pakistan, India inhabits 11 *Coeliccia* species (Subramanian, 2009); however, two species have been documented from Hong Kong and Southern parts of China (Ades and Kendrick, 2004). In Pakistan only one species, *Coeliccia renifera* has been recorded for this genus by various workers like

Khaliq (1990), Zia (2010) and Zia et al. (2008, 2011).

According to Dow and Sharma (2010), *Coeliccia vacca* is an important species of genus *Coeliccia*. It is a "Data Deficient", potentially threatened species that is known on the basis of only two female individuals with no available information on habitat preference, population and biology. Fraser (1933) also documented it as a curious species and stressed to explore it further. According to Laidlaw (1932), its female possesses a highly distinctive posterior lobe of pro-thorax (which appears like horns of cow) that makes it prominent and unique from all other species of the genus, yet no record for male of is available. According to Dow and Sharma, (2010) *Coeliccia vacca* is currently at stake of extinction and is known to be confined to northeast Indian territories facing threats from deforestation and land degradation at a rapid rate.

Materials and Methods

With a view to record Zygoptera fauna of Pakistan country wide collection surveys were conducted during summer months of three consecutive years (2005-2007) in different ecological zones of the country. From a hilly belt separating Islamabad and Murree hills specimens of *C. vacca* were recorded from three different localities (Figure 1). Details regarding geographical coordinates, altitude and habitat observed at each locality are provided to facilitate readers of this document. Recorded specimens were identified following Laidlaw (1932) and Fraser (1933). Identified specimens are housed at National Insect Museum, Islamabad for future reference and study.

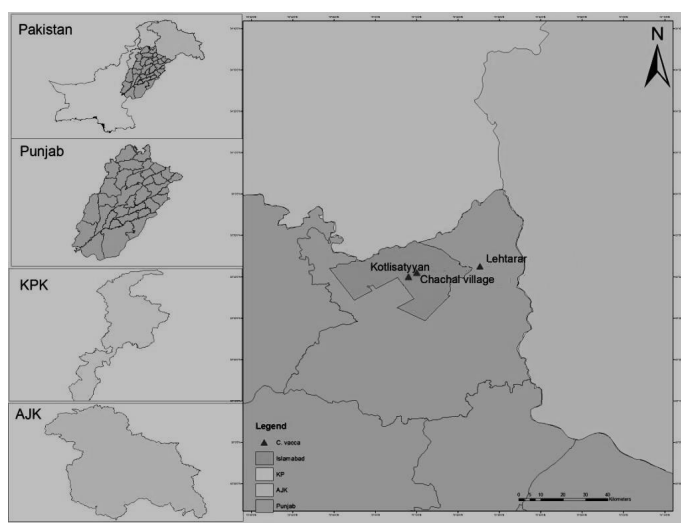


Figure 1: GIS map showing positive localities for *Coelliccia vacca* in Pakistan.

Results and Discussion

As a whole five adult females of *C. vacca* were recorded from three different sites lying in Himalayan foothills of Pakistan. Details for the specimens are as follows,

Material examined

L1: Lehtarar (33°42'N, 73°26'E; 484 m), 14. viii. 2005, 1♀; 25. vii. 2007, 1♀ (caught on air). L2: Kotlisatyan (33°40'N, 73°08'E; 396 m), 14. vii. 2005, 1♀; 18. vi. 2006, 1♀. L3: Chachal village (33°41'N, 73°10'E; 441 m), 14. viii. 2005, 1♀.

Measurement of characters

Female (♀): Abdomen = 37.2 ± 1.0 , Fore wing = 28.2 ± 0.3 , Hind wing = 27.2 ± 0.3 .

Habitat description: Specimens were collected from

three sub-mountainous spots located in foothills of Himalaya falling under administrative boundary of district Rawalpindi of Punjab province and Federal Capital, Islamabad. At L1, collection was done from a seasonal water way with dense grassy vegetation all around. At L2, water was coming from uphill spring surrounded by lush green vegetation, grasses and pine trees. Here specimens were collected from an elevation of 100ft to 150ft from road level. L3 was again a seasonal water flow passing by a small village. This spot was having dense shade of pine trees and lot of vegetables and spiky plants were grown in its proximity. Close to it was also grown wheat crop at a very small farmland.

Taxonomic identification

Collected specimens were identified as *Coelliccia vacca* following Laidlaw (1932) and Fraser (1933). Females were compared with the descriptions and differential characters are discussed as below, Head: Labrum dark brown; Prothorax: Anterior and posterior lobes yellowish to dark brown with their apices turning to black; Thorax: Yellow with mid dorsal carina broadly black towards base of wings; Wings: Pterostigma 1.5 cell long, 17 – 19 post nodals to forewings, 15 – 16 in hind, vein Riv + v arising bit earlier to subnode; Abdomen: Brownish yellow on dorsum, segments 6 to 8 dark brown turning to black at their anal ends; Anal appendages: Chocolate brown.

Terminology used: For specimen's anatomy terminology of Fraser (1933) and Laidlaw (1932) is used.

Key to the *Coelliccia* species of Pakistan:

- Dorsal lower half of thorax palish blue; posterior lobe of prothorax rounded and simple.....*renifera*
- Dorsal side of thorax having a pair of ante-humeral stripes; posterior lobe of pro-thorax extended backward producing a notch, the angles of which are prolonged into two horns (in female)*vacca*

Genus *Coelliccia* is poorly known in Pakistan. Since inception of Pakistan in 1947, only a single species reported for the country was *Coelliccia renifera*. Through the present study, *C. vacca* becomes second documented species of this genus from Pakistan. Laidlaw (1932) provided its first description on the basis of a single female specimen. According to

him, the cow horn's like structure of posterior lobe of prothorax is a very remarkable and distinguishing character on the basis of which it stands alone in the genera and can surely be named. Fraser (1933) provided it's description on the basis of "Type" housed in the Indian Museum, Calcutta. It has been reported by Fraser (1933) from Tura, Garo Hills (Assam). Mitra and Babu (2010) reported its distribution from Meghalaya (Assam) and Zunheboto (Nagaland) by citing works of Lahiri (1987) and Mitra et al. 2006 respectively. They further cited works of Tsuda (1991 and 2000) documenting its presence in Bangladesh.. According to IUCN red list status, only two females of this species are known with no information available for its habitat, population as well as for males (Dow and Sharma, 2010). Further research is highly emphasized by all these previous workers for knowing its population size, distribution trends, ecology, threats allied and taxonomy as without knowing these parameters its conservation is incredible to plan.

In the present study specimens of *C. vacca* were found in a hilly belt separating Murree and Islamabad. The area represents an Oriental distribution of insect species with traces of Palearctic fauna. Islamabad is located at 33.43°N 73.04°E at the foot of the Margalla Hills with an elevation of 507m (1,663ft). However, Murree is situated on the southern slopes of the Western Himalayan foothills as they ascend to the northeast towards Kashmir. It holds high altitude i.e. 2,300 m (7,500ft). The study provides good information on habitat, ecology and taxonomy of *C. vacca*. New geographic range has been added to its distribution by reporting three localities from Pakistan. *Coelliccia* fauna of the country now includes two species i.e. *C. renifera* and *C. vacca*. More surveys should be conducted in these newly reported niches for exploring males and immature stages of this important species. There is a dire need to put forward latest information on the positive localities with respect to climate change and increased urbanization. Further surveys in the area can surely unhide more species for this important and under explored genus.

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