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Naveed Akhtar
Department of Zoology, Government College University, Lahore, Pakistan

Hafiz Muhammad Tahir
Department of Zoology, Government College University, Lahore, Pakistan

Amir Nadeem
Department of Zoology, Government College University, Lahore, Pakistan

Faheem Nawaz
Department of Zoology, University of the Punjab, Lahore, Pakistan

Muhammad Summer
Department of Zoology, Government College University, Lahore, Pakistan

Corresponding Author:
Naveed Akhtar
Department of Zoology, G.C University Lahore, Pakistan

First report of *Cyrtarachne nagasakiensis* strand, 1918: New record from Punjab, Pakistan (Aneaera: Araneidae)

Naveed Akhtar, Hafiz Muhammad Tahir, Amir Nadeem, Faheem Nawaz and Muhammad Summer

Abstract
The spider fauna of the Pakistan is rich in diversity in agro ecosystem but still a large number of species remains unexplored. *Cyrtarachne nagasakiensis* Strand, 1918 (Aneaera: Araneidae) is first time reported species as new record from maize crop land of Punjab, Pakistan. All the description is provided on basis of habitus and genetalia. No previous record has been reported about *Cyrtarachne nagasakiensis* in World spider Catalogue till 2019 from Pakistan. The exploration of the new record of the *Cyrtarachne nagasakiensis* will increase in further spider understandings.

Keywords: Kasur, maize cropland, biodiversity, epigyne

Introduction
Spiders are major natural predators of all agro ecosystem constituting about 47,771 described species worldwide [1]. The genus Cyrtarachne is a genus of orb weaver first reported and described by Tamerlane Thorell in 1868 [2]. 55 species of the genus cyrtarachne has been accepted by World Spider Catalogue till April, 2019 [3]. *Cyrtarachne nagasakiensis* Strand, 1918 was first described from Nagasaki, Japan. Secondly, it was also described from Korea by Jo in 1981 [4] and by Hu & Li in 1987 from China [5]. As per record of the World Spider Catalogue, *Cyrtarachne nagasakiensis* is only reported from four countries i.e., China, Japan, Korea, and India with recent record in 2018**.** *Cyrtarachne nagasakiensis* Strand, 1918 is first documented Pakistan from maize crop land of district Kasur, a rich biodiversity area in the country. The present study is the part of research on project" Diversity of Insect pest of maize crop and their natural predators in district from Lahore Division, Punjab, Pakistan for a period of 3 years, from January 2017 to December 2019.

Materials and Methods
The unique specimen of *Cyrtarachne nagasakiensis* is hand collected from lower leaves whorls of maize in their initial growth stage from 10 am in from district Kasur (31.1179° N, 74.4408° E) Kasur, Pakistan.

Preservation and identification of specimen
Specimen encountered during the field study were collected and preserved in the 75% alcohol. For taxonomic investigation, the dissection of epigyne was performed using Magnus MSZ Bi and cleared in 15% solution of KOH solution for 12 Hours. The dissected specimens and epigyne were preserved using glass vials in Adman's preservative. Photographs were made using microscope LEICA HC 50/50 microscope on which a 5.0 megapixel Cannon camera was fitted. Specimens properly labeled were submitted in the Museum of Natural History, Government College University, and Lahore, Pakistan. Abbreviations employed in the figures and texts are as follows: ALE: Anterior Lateral eye; AME: Anterior median eye; PLE: Posterior lateral eye and AME-PME as inter distance of eyes.

Results and Discussion
Family araneidae clerk, 1757 [6]: *Cyrtarachne* Thorell, 1868 [3]; *Cyrtarachne nagasakiensis* Strand, 1918 [7] [Figs.1-6]. Oval shaped spermatheca with highly coiled coapulatory organ. It

can be distinguished from *Cyrtarachne bengalensis* Tikader, 1961 [8] due to lack of miniature Tubercles and intricate coiled tube [7].

Material scrutinized: 1 ♀, 31.1179° N, 74.4408° E, Kasur, Pakistan collected by Naveed Akhtar on 15th August 2019.
Total length of specimen was 8.15mm; Length of carapace was 2.03 mm, 2.38 mm width; abdomen 6.13 mm long, 7.88 mm wide, length of sternum was 0.66 mm,1.02mm wide; length and width of labium was 0.29 mm and 0.47 mm respectively; maxillae 0.58 mm long, 0.53 mm wide (Figs:1-4).Measurement of eye was as ; ALE 0.10 mm, AME 0.16 mm, PLE 0.09 mm, PME 0.16 mm, ALE-ALE 1.45 mm, AME-AME 0.21 mm, AME-MPE: 0.11 mm, AME-ALE 0.48 mm. PME-PME 0.18 mm, PLE-PLE 1.49 mm, PME-PLE 0.55 mm. Leg Measurements: 15.67 mm (1.96 mm, 0.71 mm, 1.42 mm, 1.04 mm, 0.54 mm); II on retromar 5.62 mm (1.98 mm, 0.76 mm, 1.31 mm, 0.97 mm, 0.59mm); III 4.19 mm (1.44 mm, 0.62 mm, 0.83 mm, 0.97 mm, 0.32) and IV 5.84 mm (2.05 mm, 0.85 mm, 1.34 mm, 0.93 mm, 0.67 mm). The color of carapace, labium, chelicerae and sternum was reddish brown. Chelicerae with three marginal teeth [Figs: 5-6]. Legs color was yellow brown and no spines observed. Abdomen was oval with transverse bands. Carapace, chelicera, labium and sternum reddish brown.

Habitat: Collected from maize crops of different locations from District Kasur.

Distribution: China, Korea, Japan, India and Pakistan (New Record).

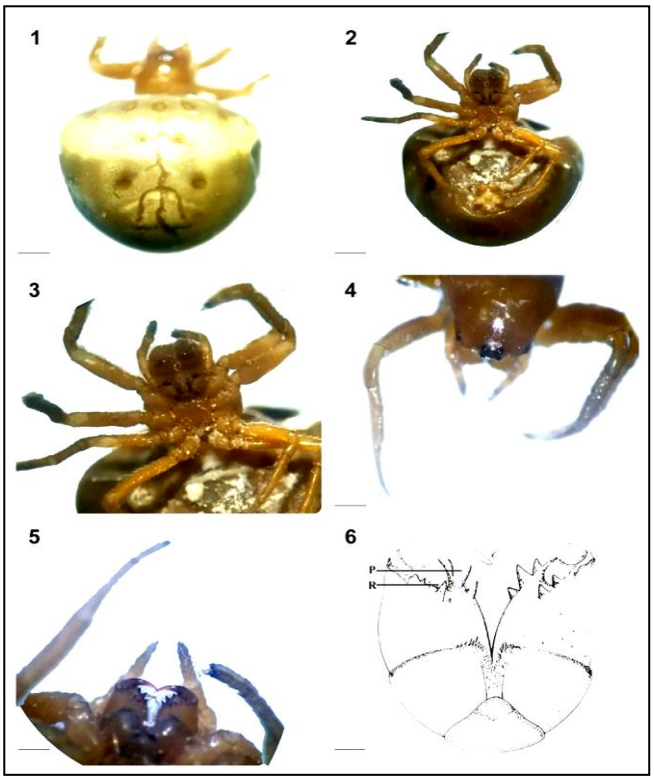

Fig 1-6: Dorsal view of *Cyrtarachne nagasakiensis;* 1 Female ventral view of *Cyrtarachne nagasakiensis*; 3, Sternum; 4, Procom, dorsal view; 5 Chelicerae; 6 explanatory drawing of chelicerae, P: Promarginal teeth, R: Retro marginal teeth. Scale bars: 2 mm (1-2), 1mm (3-4) 0.5mm (5-6)

Remarks: The specimen was collected from Chirang Reserve Forest from India in 2018 by Paris showing its occurrence in the wild habitat [9].

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