

**FIRST RECORD AND RE-DESCRIPTION OF *CARPOCORIS PUDICUS* (PODA 1761)
AND ITS IMPACT ON WEEDS AND CROPS FROM HYDERABAD REGION SINDH
PAKISTAN**

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ABSTRACT

Carpocoris pudicus Poda (1761) for the first time was recorded from Hyderabad Sindh during 2015. This species causes remarkable damage to crop and maximum number of specimens were collected from Peas (37) and rice (31) crops while least number on weeds (16), and dwell in weeds near crops, redescription of the genus and species are provided, small-sized stink bugs belonging to order Heteroptera (Tribe Carpororini). The *Carpocoris Pudicus* causes a remarkable loss to different crops and weed leaves and seeds i.e., vegetables, tomatoes, peas and crops, wheat, rice, sugarcane and weed seeds. The species is redescribed based on morphological characters, especially color, shape of head, pronotum, scutellum, antennal segments, and internal male genitalia and female genitalia. The summer was the peak season for abundance of *Carpocoris Pudicus* whereas winter was the poor season.

Keywords: First record, *Carpocoris pudicus* Poda, Redescription,

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INTRODUCTION

According to taxonomic ranking Pentatomidae is the 4th biggest family with divers of four subfamilies (Phyllocephalinae, Podopinae, Pentatominae and Asopinae) eight hundred genera and contains about forty-seven thousand species of insects included in order Hemiptera belong to group Heteroptera. They are commonly called as the 'Sting Bugs' or 'Shield bugs', all these names so called because they produce foul smell through metaphoric scent gland. Name Pentatomidae means having distinguishing five segments of antennae (Rana 1985). The 37 species from 14 genera of Carpacorini were described in Turkey (Dursun *et.al.*, 2011). The insect of tribe Carpacorini contains significant phytophagous and predaceous insects, their host plants fruits, vegetables, nuts, cotton, legumes and due phytophilous nature these are pest of many crops specially wheat. According to morphological characteristics species of Carpacorini tribe are small, oval, and elongated in shape and bright to dark in color. The phytophilous and predaceous bugs distinguished by external appearance of proboscis, the plant eating bugs have tapered proboscis 1st segment attached to most of its length, while the predacious bugs have extensive proboscis, its 1st segment free from head, the adult and nymph of predaceous stink bugs piercing and sucking type of mouth parts (Mc person.2007; Pannizi; 2000). *Carpocoris pudicus* (Poda 1761) belongs to Genus *Carpocoris* Kolenati, tribe Carpacorini (Pentatomidae: Pentatominae). There are four species of Genus *Carpocoris* Kolenati up to date since 1958 were discovered in western Europe such as *Carpocoris purpureipennis* (De Geer, 1773), *Carpocoris fuscispinus* (Boheman, 1851), *Carpocoris pudicus* (Poda, 1761) and *Carpocoris melanocerus* (Mulsant & Rey, 1852), another 5th species of this genus *Carpocoris mediterranean* (Tamanini, 1958) was then labelled, it is similar to *C. fuscispinus* (Tamanini, 1958). According to taxonomic novelty description this genus further divided into two groups 1st one containing three

species *Carpocoris purpureipennis*, *Carpocoris mediterranean* and *Carpocoris fuscispinus*, all these three species distinguish character having "two teeth" while the 2nd one consist on two species *Carpocoris pudicus* (Poda, 1761) and *Carpocoris melanocerus* (Mulsant & Rey, 1852), these two species differentiated above species because having only one teeth being a distinguished character (Lupoli *et .al.*, 2013). Other morphological characters of *Carpocoris pudicus* (Poda, 1761) Pronotum wider than abdomen with parallel spots on scutellum not grooved (Lupoli *et.al.*, 2013), *Carpocoris pudicus* having sharp humeral angles (south wood and Leston 1959).

The examined material of *Carpocoris pudicus* was collected during the ongoing systematic studies on insect diversity of Hyderabad region, which has already been a subject of several papers, including new records of three species in the region, the current study was carried out to fill the gap of systematics and description of species and impact *Carpocoris pudicus* (Poda, 1761) on crops and weeds in Hyderabad region of Sindh Pakistan.

2. MATERIALS AND METHODS

Area of study

This research work was carried out in region Hyderabad, comprising of four localities (Jamshoro, Tando jam, Hyderabad, Latitabad) from January to December (2015) (Figure.1), during the Field survey, 67♂, ♀124 specimens of species *Carpocoris pudicus* (Poda, 1761) were collected and the samples were kept at the Entomology laboratory, Department of Zoology, University of Sindh Jamshoro.

Collection methods

These sting bugs were captured by light traps and formal way of hand picking from various weeds and crops i-e wheat, rice, sugarcane, weeds (surrounding the crops) and vegetables like Peas, Tomatoes, and coriander fields. The specimens were kept in plastic Jars, photographs of host plants were also taken and then taken to laboratory for further examination.

PRESERVATION AND IDENTIFICATION

The samples were kept into jars and made faded and paralyzed by chloroform. Specimen were carefully mounted and well-kept in preserving insect boxes (Figure.2) Terminology used for external characters is of (Zaidi

1986) and labelled each specimen according to standard procedure, and naphthalene balls used for protection from ants, lizards, and fungus (Rana 1985).

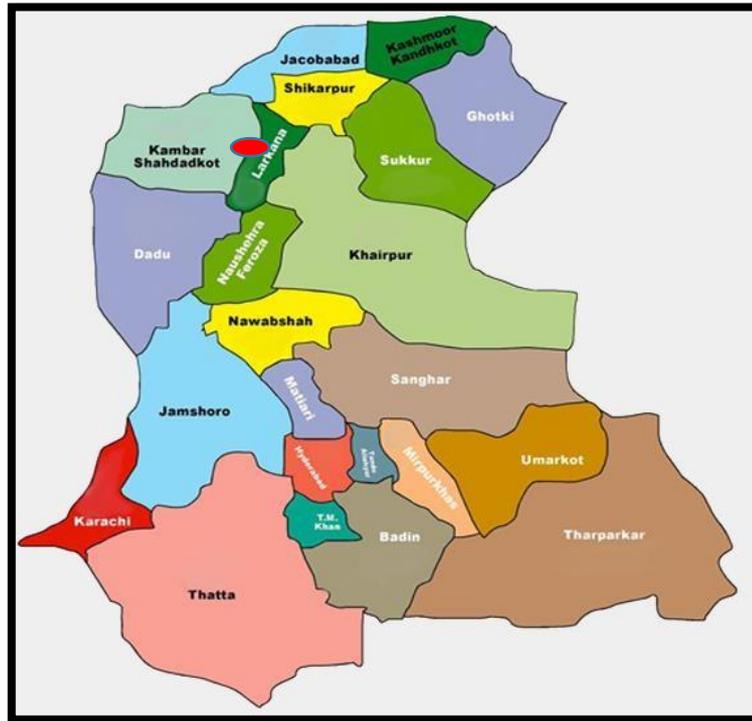


Figure 1. Map of Hyderabad and adjoining areas, showing study areas



Figure 2. Showing adult stink bugs preserved in insect boxes and Figure 3. Showing boiling process of male in insect boxes and female genitalia

Dissection of genitalia (male and female)

For dissection of genitalia the mid part of male, posterior region dipped into KOH and boiled for 10-15 minutes. (Figure.3), by help of forceps carefully separated male genitalia organs (Aedeagus, Parameters and Pygophore) from abdomen under microscope. The terminalia of female specimen were also removed and boiled same as male genitalia (Schaefer, 1968). The genitalia of both male and female organs were preserved into micro vials with the drop of glycerol and pinned with specimen (Ahmad & Mc Pherson 2007), all body parts of specimen were dignified into millimeter (mm) by ocular micrometer. Drawings were drawn on graph paper by the ocular graph below the dissecting microscope with the help of gratitude eyepiece and traced with rottering pointer on butter paper (Afzal & Ahmad, 1981). All the specimen paratype were placed in insectary of University of Sindh Jamshoro.

RESULTS

Genus *Carpocoris* Kolenati, (1846).

Species *Carpocoris pudicus* (Poda, 1761).

Having semi-lunar shape with recognized as sharp angled, Hemelytral mark thin, asymmetrical, profounder, curved inter spaces.

General characters of *Carpocoris pudicus* (Poda, 1761)

Coloration

Overall body orchareous except lateral margin of pronotal angles, stripes on head and callosities, antennae, connexiva black, dark black punctuation on scutellum, white spot-on tip of scutellum, hemelytra pink, ocelli pink, eyes reddish brown, legs golden brown.

Head

Head slightly shorter than pronotum, paraclypei longer than clypeus not enclosing in front, pronotum wider than long, anterior angles toothed directed towards anteriads, humeral angles a little produced, sides of head slightly concave, antennae five segmented.

Thorax

Width of pronotum distinctly two times wider than long, anterior angels toothed directed towards anteriad, humeral angles sub-round, lateral margin almost

straight, and scutellum slightly longer than broad, more than two times longer than head, tip sub round, membrane of hemelytra extending beyond the length of abdomen.

Abdomen Slightly longer than broad, connexiva expose at repose.

Male genitalia

Pygophore almost broader than long, dorsoposterior margin a little bit concave, lateral lobe produced, ventroposterior membrane spinose; paramere f-shaped, apex of blade wide and sub round, outer margin convex, inner margin with two spines; Inflated aedeagus having thecal appendages with a pair of node, ventral conjunctival membrane sclerotized, dorsal conjunctival membranes tomb-shaped (Figure.4 b, c, d).

Female genitalia

Terminalia with first gonocoxae quiet triangular, with apices slightly round wide apart; 2nd gonocoxae distinctly broader than long; 8th paratergites usually quadrangular having posterior margin grooved, 9th paratergites long lobe like mostly crossing the posterior fused margin of 8th paratergites; sperm theca long than broad, distal spermathecal duct 2 times shorter than proximal spermathecal duct, spermathecal bulb distinctly round without any projections. (Figure.5 e, f)

REDESCRIPTION (Head): Head slightly descending, margins of paraclypeus circular and larger than clypeus, the length of head 1.3mm, width 7mm, the first portion longer than the second section, length of antenna, the distance of first antennal segment 0.3mm, the distance of second antennal segment (1.2mm), the distance of third antennal 0.9 mm, the distance of fourth antennal segment 8mm, the distance of fifth antennal segment 1.1mm, *Pronotum* trapezoid, anterior margin slightly concave, lateral and posterior margin nearly straight, Pronotum highest at line connecting humeral angles, sloping anteriorly towards head Pronotal disk flat, slightly sloping towards lateral and posterior margin. Anterior margin of pronotum raised, forming sharp collar (most prominent laterally) constricted posteriorly by deep

transverse groove continuing to propleura; *Scutellum* triangular, longer than wider, only anterolateral angles with small depressions, apex acutangulate and whitish: **Thorax.** Mesosternum depressed between mesocoxae. Metasternum anteriorly convex, narrowing posteriorly, metacoxae situated close to each other.

Wings: Connexiva widest approximately at mid length, slightly convex medially; posterolateral angle of corium acutangulate,

Male genitalia. Pygophore slightly brownish, insinuated anterolaterally, posterolateral angles distinctly produced, lobe-like, surrounding parameres laterally; apex of blade wide and sub round, outer margin convex, inner margin with two spines; Inflated aedeagus having thecal appendages with a pair of nodes, ventral conjunctival membrane sclerotized, dorsal conjunctival membranes tomb-shaped (Figure.4 b, c, d).

Female genitalia: Terminalia with first gonocoxae triangular, with apices slightly round wide apart; 2nd gonocoxae broader than long; 8th paratergites usually quadrangular having posterior margin grooved, 9th paratergites long lobe like mostly crossing the posterior fused margin of 8th paratergites; sperm theca long than broad. (Figure. 5.a-b)

The total number of specimens collected. (67♂, ♀124) = 191, while 150 Number of specimens were identified on different host plants, the maximum number was captured at Peas with 37 individuals followed by, coriander, rice, tomatoes, wheat, sugarcane, and weeds with 33, 26, 22, 18, and 15 individuals respectively and their month wise distribution (Figure. 6) in Hyderabad region, Sindh, Pakistan. The environmental factors from April – June were favorable as most of their host plants were found in the season while January, November, and December unfavorable season with less availability of host plants.

REMARKS

This species is closely related to *C. minutes* in having head distinctly longer than broad, lateral margins of pronotum not serrate, but can easily be scattered from same in having humeral angles of

pronotum subround, in contrast to having pronotal humeral angles pointed. According to European research study on behalf of morphological and critical studies, only records a single species of *Corpocoris*, *Carpocoris pudicus* Poda (1761) is considered to synonymizing with *C. purpureipennis* (Ribes et al 2007). This species mostly captured on crops that were surrounded by thick growth of weeds because it provides them shelter to live in it.

DISCUSSION

Carpocoris pudicus Poda (1761) is generally known as stink bugs and collected from four different localities of Hyderabad region. About 190 specimens were cumulated during the survey of study period from January to December 2015 out of which 67 were males and 124 were females. Above species was new record of Hyderabad region (Sindh). The maximum number of samples were caught at Peas and coriander (37 and 31) whereas least number of samples were caught at wheat and weeds (18 and 15) and (15) respectively. Month wise distribution showed highest population was recorded in months of April, May, and June while least population was observed in months January, November and December (Figure. 6). The *Carpocoris pudicus* Poda (1761) Was formerly described by many research scholars of different zones in world and discoursed, about diversity and plenitude without any expressive description. During present study one of the important species of Genus *Carpocoris* Kolenati; Species *Carpocoris pudicus* Poda (1761) was first time recorded and redescribed from Jamshoro (Hyderabad), from host plants such as tomatoes, brinjals, wheat, weeds, rice and with one new host plant coriander (Table.1) and (Figure. 7). Same study was conducted by (Dursun *et.al.*, 2011) in Turkey and described the sixteen localities of Turkey and four host plants, but their study did not express more details about identification of this species. In Pakistan very little work has been done in Baluchistan and Sindh. As namely Ahmad *et. al.*, (1974) studied tribe *Carpocorini* and host plants from Sindh, Ahmad *et.al.*, (1974) described the taxonomy of *Holocosthecus* of

Baluchistan Pakistan. Zaidi (1987) did good work on tribe Carpocorini from Sindh excluding Hyderabad region and interior Sindh. Ahmad *et.al* (1974) described taxonomy and revised Mormidella from Indo-Pakistan. Three species of genus Carpocoris Kolenti of tribe Carpocorini were recorded, among them *Carpocoris pudicus* was redescribed from different localities of Hyderabad region.

CONCLUSION:

The present study was conducted from Hyderabad and its adjoining areas for first time, the ecology of studied areas supported variety of fauna including

Carpocoris pudicus (stink bugs) of tribe Carpocorini for first time on wheat grains, coriander and weed seeds. These are minor pest of wheat and weed seeds, but they are beneficial in utilizing weed seeds because they cause great loss in economy.

AUTHOR'S CONTRIBUTION.

Reshma Sahito wrote the paper, Nasreen Memon analyzed the data and finalized the paper, Aiman Amur and Seema Memon have analyzed the data statistically and took measurements and prepared graph, Shabana Mangi supported the laboratory work in the sampling

Table-1. Showing the distribution of species *Carpocoris pudicus* Poda (1761), number of Specimens and host plants from, Hyderabad region of Sindh Pakistan.

Species <i>Carpocoris pudicus</i> Poda (1761)					
Date of collection	Locality name	Male ♂	Female ♀	Host plants (Scientific names)	Host plants (Common names)
3-1-2015	Hyderabad	0	1	Panicum capillare Tritium aestivum	Weeds, Wheat
02-2-2015	Latifabad	1	3	Saccharum officinarum	Sugarcane
15-3-2015	Tando jam	12	25	Pisum sativum	Peas
10-4-2015	Jamshoro	8	18	Panicum capillare Tritium aestivum	Weeds, wheat
18-5-2015	Jamshoro	10	12	Coriandrum sativum	Coriander
10-6-2015	Hyderabad	7	11	Oryza sativa Panicum capillare	Rice Weeds,
20-7-2015	Latifabad	5	9	Saccharum officinarum	Sugarcane
12-8-2015	Tando jam	9	17	<i>Solanium lycopersicum</i>	Tomatoes
20-9-2015	Jamshoro	7	13	Oryza sativa <i>Panicum capillare</i>	Rice, Weeds
15-10-2015	Jamshoro	4	7	Coriandrum sativum	Coriander
27-11-201	Tando jam	2	5	Oryza sativa <i>Panicum capillare</i>	Rice, Weeds
15-12-2015	Jamshoro	2	3	<i>Tritium aestivum</i>	Wheat
Total		67	124		

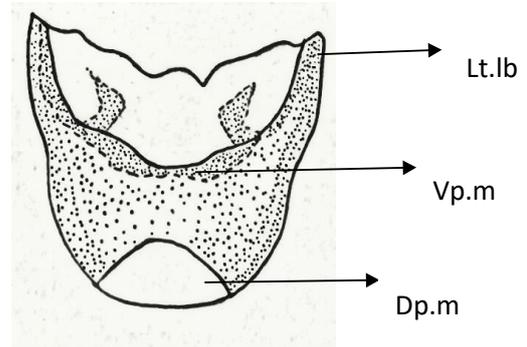
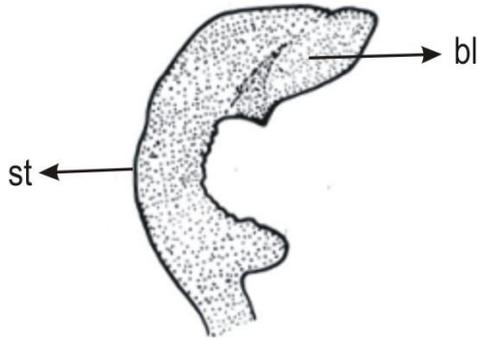
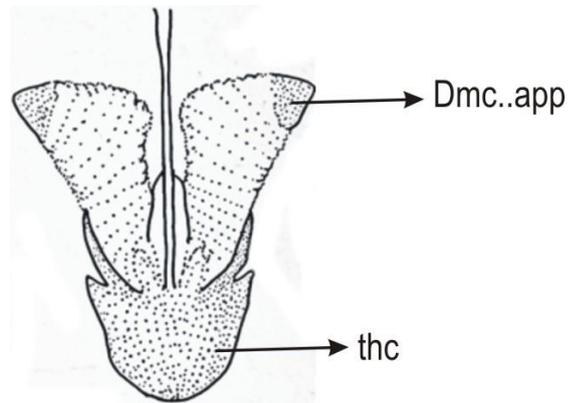


Figure.4 Showing dorsal view of *Carpodocoris pudicus*.

(a) Pygophore



(b) Paramer



(c) Aedeagus

Figure.4 (a-c) Showing different parts of male genitalia of *Carpodocoris pudicus*

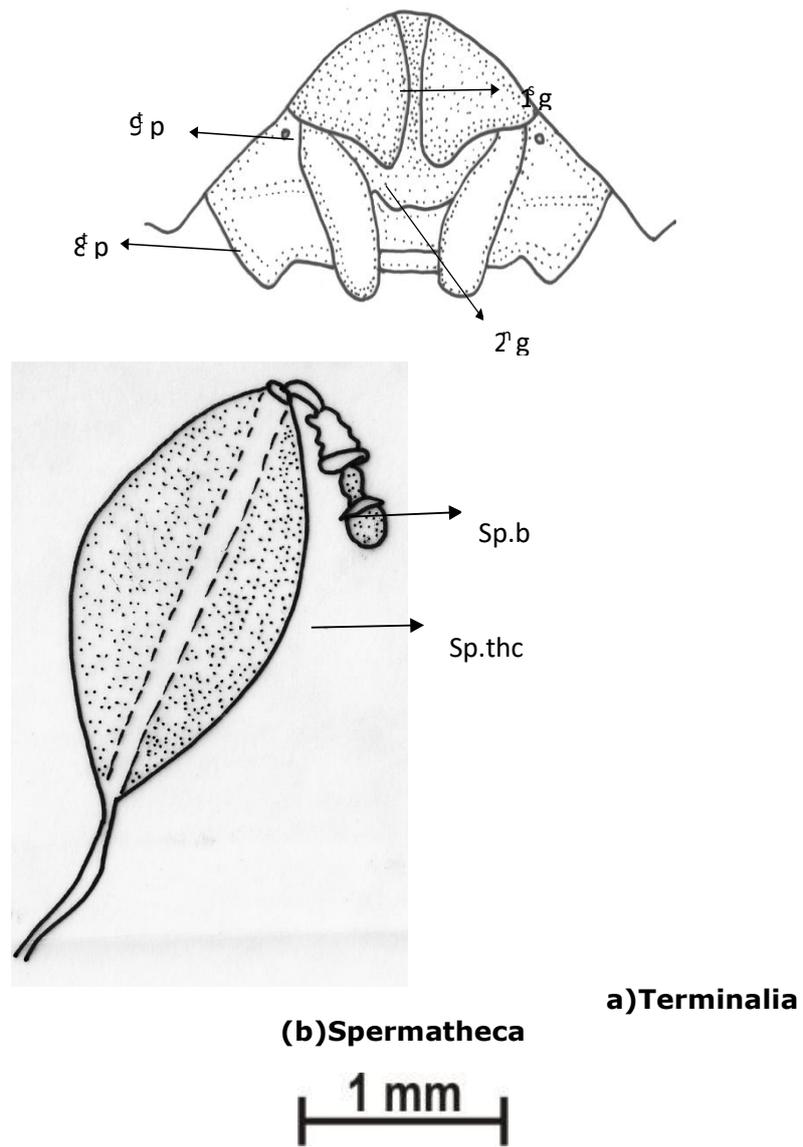


Figure 5. (a-b) Showing different parts female genitalia *Carpororis pudicus*

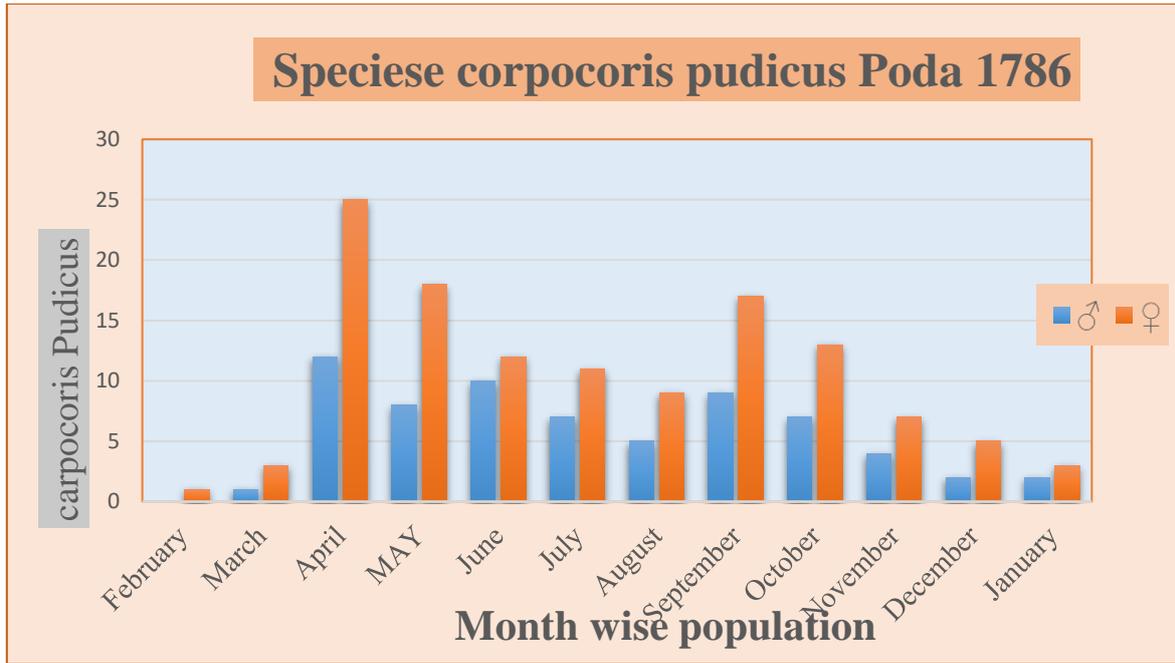


Figure.6 showing moth wise distribution of *Carpocoris pudicus* Poda (1786) January-December 2015



Figure. 7 showing the host crops (a) Rice (b) Wheat (c) Sugarcane

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