



## BIODIVERSITY OF FAMILY PIERIDAE FROM TANDOJAM PAKISTAN

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### ABSTRACT

Collection of family Pieridae from Tandojam area was done with the aim to enrich our knowledge on the diversity of these economically important families in our agro-ecosystem. The experiment was conducted at the Insect Systematic Laboratory, Department of Entomology Sindh Agriculture University Tandojam. During the study 62 members of family Pieridae were collected from various localities of Tandojam. Results showed that the family Pieridae revealed the occurrence of 09 species under two sub-families; Pierinae with the record of one species and Coliadinae with eight species record.

**Keywords:** pieridae, pierid butterfly, Tandojam, taxonomy

### INTRODUCTION

The family Pieridae includes most familiar butterflies also known as Cabbage-White and Grass Yellow. They have long stable status of the species in this family (Nazari *et al.*, 2011). The larvae of most Pierid butterflies feed on different cultivars of mustard (Brassicaceae) and leguminous (Fabaceae) (Mal *et al.*, 2013). The Indian sub-continent has nearly about 1439 species of butterflies, out of them 400 species are reported from Pakistan (Khan *et al.*, 2000; 2007). Doherty (2001) worked for the first time on the diversity of butterflies of Kashmir. After that, Swine (1987) worked on the taxonomy of butterfly fauna from Karachi and its adjoining areas. Keeping in view the importance of Pierid butterfly fauna in agriculture, the present study was conducted around Tandojam, Sindh, Pakistan.

### MATERIALS AND METHODS

The study was conducted at Insect Systematic Laboratory, Department of Entomology, Sindh Agriculture University Tandojam. The adult Pierid butterflies were collected through hand-net from different localities of Tandojam. Pierid butterflies were killed in killing bottle containing potassium cyanide and mounted through entomological pins. For adult butterfly images high pixel camera was used and for the study of

genitalia, microscopes (a) Labomed CSM2 (20X and 40X), (b) Kyowa Medilux 20 were used.

### Methods of identification

For the identification of specimens up to the species level, keys were followed for the region.

### RESULTS AND DISCUSSION

In present study total 62 members of the Pieridae were collected from Tandojam Sindh, Pakistan, 09 species were from two sub-families: Coliadinae (Swainson, 1827) and Pierinae (Duponchel, 1832). One species *Belenois aurota* (Fabricius, 1793) under sub-family and tribe Pierinae and Pierini, respectively. Sub-family Coliadinae (Swainson, 1827) revealed 08 species under the tribe Colotini (Larsen, 1983) including, *Colotis vestalis* (Butler, 1876) *Colotis amata* (Fabricius, 1775), *Colias romanovi* (Grum-Grshimailo, 1885), *Catopsilia pomona* (Fabricius 1775), *Catopsilia florella* (Fabricius, 1775), *Catopsilia pyranthe* (Linnaeus, 1758), *Eurema brigitta* (Cramer, 1780), *Eurema hecabe* (Linnaeus, 1758).

### Taxonomy

Order: Lepidoptera Linnaeus, 1758  
Suborder: Glossata Fabricius, 1775  
Superfamily: Papilionoidea Latreille, 1802  
Family: Pieridae Swainson, 1820

### *Belenois aurota* (Fabricius, 1793)

*Identification.* The upper surface of the male is white in color and the fore wings are dusky black

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in colour and there is a streak on the lower apex of the cell, the antennae are black in both sexes, the body rejoiners are white, only thorax is bluish grey from upper side.

**Material examined.** Pakistan: 3♂, 4♀, Sindh Prov., Tandojam, 15.vii.2014, Nazir, Campus.

***Colotis vestalis*** (Butler, 1876)

*Identification.* The upper side of male has white ground color, fore and hind wings have black colour margins, costal margin is broadly at its apical area with dusky grey scales. The color of head, thorax and abdomen is black while antennae having speckled and tipped white.

**Material examined.** Pakistan: 1♂, 1♀, Sindh Prov., Tandojam, 25.viii.2014, Nazir, Horticulture garden.

***Colotis amata*** (Fabricius, 1775)

*Identification.* These are the yellow butterflies, both fore and hind wings possess costal and terminal margins with reddish-brown, forewings contain apical and terminal margins with deep color. Hind wings terminal margins are narrow black posteriorly and anteriorly, while dorsal margins are broadly paler than ground color.

**Material examined.** Pakistan: 1♀, Sindh Prov., Tandojam, 09.viii. 2014, Nazir, Hostel.

***Colias romanovi*** (Grum-Grshimailo, 1885)

*Identification.* The broad black marginal band of the forewing of the male is usually without spots, but bears sometimes a row of contiguous well-defined yellow subapical spots, there is also yellowish submarginal spots on the hind wing; The underside of forewing is yellow and the proximal portion light orange-red, the submarginal spots of the forewing are sometimes absent or blackish.

**Material examined.** Pakistan: 1♂, Sindh Prov. Tandojam 03.vi.2014, Nazir, Horticulture garden

***Catopsilia Pomona*** (Fabricius 1775)

*Identification.* Male upper side is chalky white in color in rare cases, male basal part possesses sulphur-Yellow color on both fore and hind wings and sometimes Sulphur Yellow color spread in all directions over the wings and it becomes pale towards terminal margins. The forewing whole or some time apical half become black.

**Material examined.** Pakistan: 1♂, Sindh Prov., Tandojam, 21.iv.2014, Nazir, SAU campus.

***Catopsilia florella*** (Fabricius, 1775)

*Identification.* The wingspan of male is 54-60 and female of 56-66 mm in length, during summer to autumn seasons adult butterfly migrates from South Africa, mostly travels in north to east directions.

**Material examined.** Pakistan: 1♂, Sindh Prov., Tandojam, 17.vii. 2014, Nazir, Hostel.

***Catopsilia pyranthe*** (Linnaeus, 1758)

*Identification.* The upper side of *Catopsilia pyranthe* is chalky white few specimens are green in upper surface. Forewing margins are dark brown and their width varies in size.

**Material examined.** Pakistan: 1♂, 1♀, Sindh Prov., Tandojam, 27.vi. 2014, Nazir, Latif farm.

***Eurema brigitta*** (Cramer, 1780)

*Identification.* These butterflies are with lemon yellow wings with black border scalloped. Under the forewings there are yellow freckled brown spots. Males do not have an elongate patch above and below portions of the cubical vein on the fore wing.

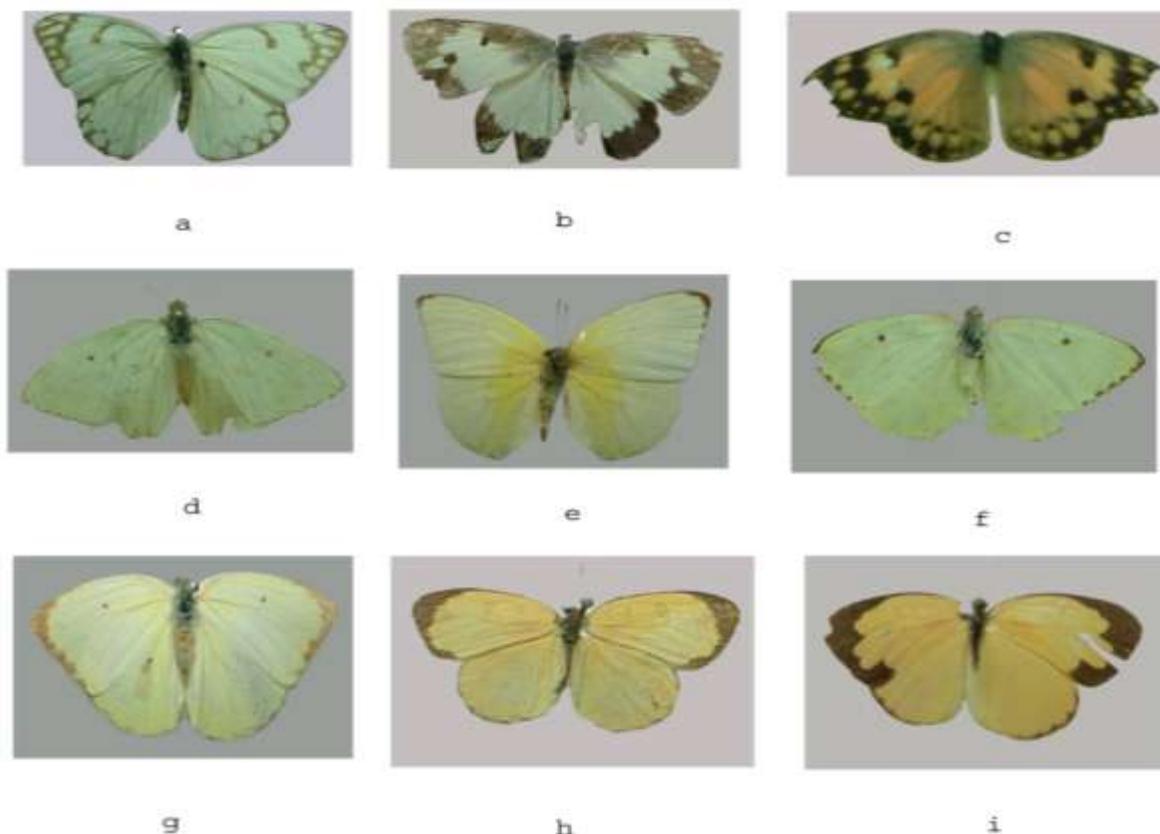
**Material examined.** Pakistan: 1♀, Sindh Prov., Tandojam, 11. vii. 2014, Nazir, Malir Experimental Farm.

***Eurema hecabe*** (Linnaeus, 1758)

*Identification.* Male Upper side is yellow while female under side is also yellow but generally with slightly paler shade than that of the upper side, with the following reddish-brown markings the antennae of *Eurema hecabe* are grayish yellow in colour.

**Material examined.** Pakistan: 2♀, Sindh Prov., Tandojam, 07. viii. 2014, Nazir, Latif farm.

The study conducted on very important group of butterflies, family Pieridae Swainson, 1820, which consists of 91 genera, 1,164 species (Zhang, 2011). These are commonly observed on meadow with usually yellow, white or orange colours with remarkable dark spots, which are resulted from the waste products of their body and is important characteristics of the family (Carter and Hargreaves, 2000).



**Plate 1.** Pieridae a-i: (a) *Belenois aurota*, (b) *Colotis vestalis*, (c) *Colotis amata*, (d) *Colias romanovi*, (e) *Catopsilia pomona*, (f) *Catopsilia florella*, (g) *Catopsilia pyranthe*, (h) *Eurema brigitta*, (i) *Eurema hecabe*

The caterpillars of Pieridae feed on family Brassicaceae and are notorious pests of agricultural crops. The present attempt is very preliminary and it only provides the baseline data to incite the researchers on diversity and richness of family Pieridae in Tandojam. Future attempts for collection may be planned and undertaken to update the diversity.

Fabricius (1793) placed *aurota* in genus *Papilio*, colour variation is noted between dry and wet season forms. *Colotis vestalis* are commonly called as white arabs and is distributed in Sindh, Baluchistan, Kutch and Gulf. Butler (1876) originally placed *vestalis* in genus *Teracolus* several species are synonymized under this species. *Colotis amata* originally placed in genus *Papilio* and are commonly called as small salmon arabs. Several sub-species and synonyms are known to occur. *Colias romanovi* is distributed in Oriental and Palaearctic regions, two sub-species are reported; *Colias romanovi* and *Colias romanovi seravschana*. *Catopsilia*

*Pomona* commonly called as lemon emigrant, since its name indicate its migratory behavior. Small Grass-Yellow butterflies *Eurema brigitta* are frequently found in Tandojam in contrast large Grass=Yellow *Eurema hecabe* have many synonyms and sub-species, very complicated from identification view point.

### CONCLUSION

During the course of study 62 members of family Pieridae were collected, that revealed the occurrence of 09 Pierid butterflies in Tandojam.

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