



ISSN 2347-2677

IJFBS 2017; 4(1): 41-44

Received: 08-11-2016

Accepted: 09-12-2016

VK Mattu

Sociobiology and Behavioral
Ecology Research Laboratory,
Himachal Pradesh University
Shimla, India

Romila Devi

Sociobiology and Behavioral
Ecology Research Laboratory,
Himachal Pradesh University
Shimla, India

Pawan Kumar

Himalayan Forest Research
Institute Panthaghathi, Shimla,
India

Taxonomic studies on two species of Genus *Vanessa* (Lepidoptera: Nymphalidae: Nymphalinae) from Himachal Pradesh

VK Mattu, Romila Devi and Pawan Kumar

Abstract

The genus *Vanessa* Fabricius, 1807 belong to family Nymphalidae and subfamily Nymphalinae. The butterflies of the genus *Vanessa* were collected from different Sub-Alpine localities of Himachal Pradesh during August 2013 to October 2013. During present investigation two species namely *Vanessa cardui* (Linnaeus, 1758) and *Vanessa Indica* (Herbst, 1794) were identified on the basis of morphological features and external genitalia. An attempt has been made to study various genitalic parts like the uncus, valva, saccus and aedeagus.

Keywords: Nymphalinae, *Vanessa cardui* (Linnaeus), *Vanessa indica* (Herbst), Genitalia, Himachal Pradesh

1. Introduction

The genus *Vanessa* Fabricius, 1807 belong to family Nymphalidae, subfamily Nymphalinae and tribe Nymphalini. The species of the genus *Vanessa* Fabricius, 1807 namely *Vanessa cardui* (Linnaeus, 1758) and *Vanessa Indica* (Herbst, 1794) are widely distributed throughout the world except in Arctic. Genus *Vanessa* was extensively revised by [1] and resurrected genera *Bassaris* and *Cynthia* have been resynonymized with *Vanessa* [2, 3]. The cosmopolitan butterfly genus *Vanessa* contains 21 species, 10 of which are represented in the Neotropical region [4, 5]. The species are commonly known as painted lady and Indian red admiral. Painted lady is pink with dark brown markings and Indian red admiral black with red bands on forewing. Indian red admiral species found in temperate and tropical forests. Butterflies of family Nymphalidae are called brush-footed butterflies because forelegs are clothed with long hairs. These species are familiar to many people in the Holarctic & Palaearctic region, the painted lady *Vanessa cardui* (Linnaeus, 1758) which has a global distribution and are known to be migrant [6, 7]. The subfamily Nymphalinae has been studied in india by [8-10]. The present study deals with taxonomic status of the genus *Vanessa* from Himachal Pradesh.

2. Materials and Methods

The butterflies were collected from different localities i.e Kalatop, Khajjiar, Hattu (Narkanda), Chanshal of Himachal Pradesh during August 2013 to October 2013. The collected specimens were killed with the help of Ethyl acetate vapours. Then pinned by entomological pins of 38 mm length, nos. 3 and 5 for large and 20 for small specimens. For the examination of genitalia, the abdomen of butterfly was detached. The detached abdomen was then put into 10% KOH solution and the same was put in an oven for 10-12 hours at about 45 °C in order to soften the chitin and to dissolve away the muscles. The material was then washed with distilled water. After proper washing, material was dissected in 10% alcohol and genitalia were removed carefully with the help of fine needles, watching under Nikon SMZ Trinocular zoom stereomicroscope. Genital terminology was used given by [11, 12].

3. Results and Discussion

3.1 Key to the two species of genus *Vanessa*

1. Upper side of the fore wing ochreous red at basal area with four white spots, hindwing dark brown with five black spots; saccus broadly rounded.....*cardui*
(Linnaeus) ...Upperside of forewing dark brown, terminal band.....2

Correspondence

VK Mattu

Sociobiology and Behavioral
Ecology Research Laboratory,
Himachal Pradesh University
Shimla, India

2. Upperside of forewing dark brown at basal area with three centered black spots, hindwing with black-spotted reddish terminal band; saccus u- shaped.....*indica* (Herbst)

3.2 Genus *Vanessa* Fabricius

Vanessa Fabricius, 1807, p. 281, [13] —Latreille, 1810, pp. 354, 400 [14] —Zimmerman, 1958, pp [15].

3.2.1 *Vanessa cardui* (Linnaeus, 1758) - The Painted Lady (Plate 1, Fig.1, 2, 3)
Papilio cardui Linnaeus, *Syst. Nat.*, 10th ed.: 475.1758.

3.2.2 Description: Head dark black, eyes brown, antennae long. Thorax black. Forewing ochreous red at basal area; four spots at upper edge. Hindwing dark brown with a row of larger five black spots. Underside of forewing and hindwing orange, dark brown. Abdomen dark brown. Legs black.

3.2.3 Distribution: This species was recorded from, Kalatop, Khajjiar, Hattu (Narkanda), Chanshal localities of Himachal Pradesh.

3.2.4 Old distribution: Myanmar, Sri Lanka and Himachal Pradesh

3.2.5 Habits and Habitat: This species was reported upto 4,500 metre in the Himalayas. Species was widely distributed, probably due to its migratory habit.

3.2.6 Food plants: *Taraxacum officinale*, *Debregeasia bicolor*

3.2.7 Wing expense: ♂58 mm

3.2.8 Male Genitalia: Uncus uniform, gnathos long, sclerotized; valva broad, apex acute, setosed; saccus broadly rounded; aedeagus thin, long, cornuti absent.

3.3 *Vanessa indica* (Herbst, 1794) – Indian red admiral (Plate 2, Fig.1, 2, 3)

Papilio indica Herbst, Nat. Schmett., 7: 171; 1794

3.3.1 Description: Head black, eyes dark brown, antennae dark brown. Thorax dark black with brown feathers. Upper side of forewing basal area dark brown, discal area orange with three black bands, apex dark black with three white bands, outer margin border dark black. Upperside of hindwing dark brown with brown tufts of hairs. Terminal end with black spotted reddish band. Abdomen black. Legs brown.

3.3.2 Distribution: This species was recorded from Khajjiar (Chamba), Hattu (Narkanda).

3.3.3 Old distribution: Jammu & Kashmir, Kumaon (Uttarakhand)

3.3.4 Habits and Habitat: Reported up to 3500 metre subalpine forests. It was found in the higher altitude regions of the Himalaya.

3.3.5 Food plants: *Urtica dioica*.

3.3.6 Wing expense: ♂59 mm

3.3.7 Male genitalia: Uncus v-shaped, sclerotized; tegumen broad, sclerotized; valva elongate, costa margin straight, apex pointed with long hairs, sclerotized; saccus u- shaped; aedeagus sharply pointed at distal end.

4. Conclusion

Vanessa cardui (Linnaeus, 1758) and *Vanessa Indica* (Herbst, 1794) are collected from Kalatop, Khajjiar, Hattu (Narkanda), Chanshal localities of Himachal Pradesh. The species of the genus *Vanessa* Fabricius *Vanessa cardui* (Linnaeus, 1758) and *Vanessa Indica* (Herbst, 1794) are described on the basis of external morphological characters and external genitalia. The genitalic attributes of the genus *Vanessa* will be useful for future research studies.

Plate-1

Vanessa cardui (Linnaeus, 1758) - The Painted Lady

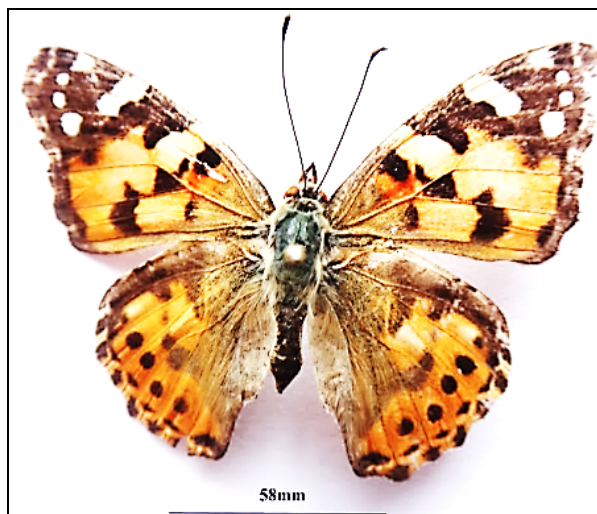


Fig 1: Adult

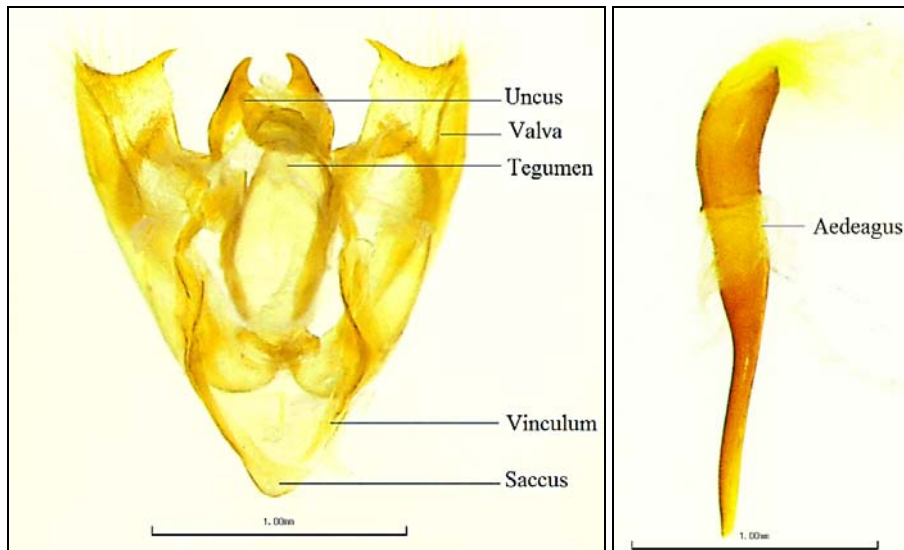


Fig 2: Male genitalia

Fig 3: Aedeagus

Plate 2: *Vanessa indica* (Herbst, 1794) – Indian red admiral

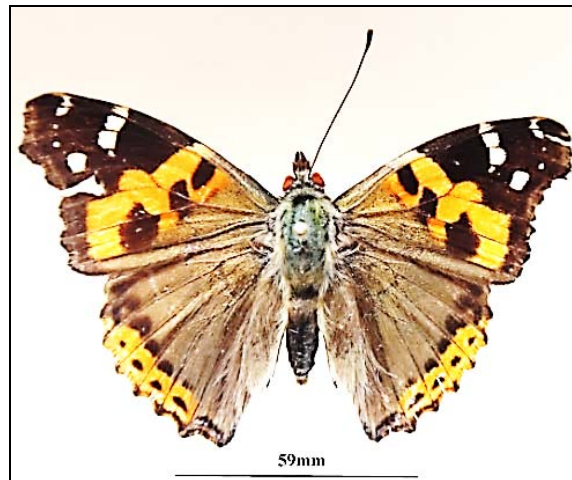


Fig 1: Adult

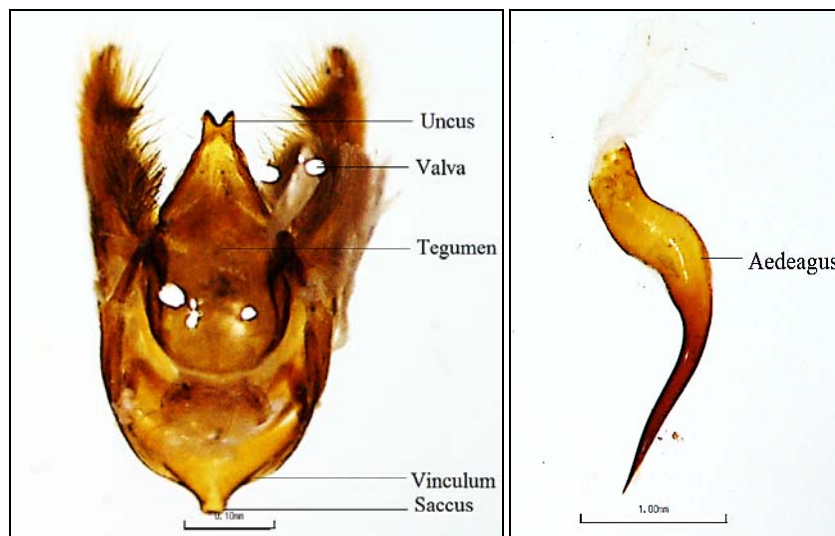


Fig 2: Male genitalia

Fig 3: Aedeagus

5. Acknowledgement

The authors are grateful and acknowledge Ministry of Environment and Forests and Climate Change (MOEF & CC, GOI) for financial assistance and also grateful to the Director, Himalayan Forest Research Institute (HFRI), Shimla for providing necessary research facilities.

6. References

1. Field WD. Butterflies of the genus *Vanessa* and of the resurrected genera *Bassaris* and *Cynthia* (Lepidoptera: Nymphalidae). *Smithsonian Contributions to Zoology*. 1971; 84:1-105.
2. Wahlberg N, Brower AVZ, Nylin S. Phylogenetic relationships and historical biogeography of tribes and genera in the subfamily Nymphalinae (Lepidoptera: Nymphalidae). *Biological Journal of the Linnean Society*. 2005; 86:227-251.
3. Vane-Wright RI, Hughes HWD. Did a member of the *Vanessa indica* complex (Nymphalidae) formerly occur in North America? *Journal of the Lepidopterists Society*. 2007; 61:199-212.
4. Lamas Nymphalidae G. Nymphalinae, In: Lamas, G. (Ed.), Checklist: Part 4A. Hesperioidea Papilionoidea. In: Heppner, J. B. (Ed.), *Atlas of Neotropical Lepidoptera*. Volume 5A. Gainesville, Association for Tropical Lepidoptera; Scientific Publishers, 2004; 474:249-257.
5. Wahlberg N, Rubinoff D. Vagility across *Vanessa* (Lepidoptera: Nymphalidae): mobility in butterfly species does not inhibit the formation and persistence of isolated taxa. *Systematic Entomology*. 2011; 36:362-370.
6. Stefanescu C. Migration patterns and feeding resources of the Painted Lady butterfly, *Cynthia cardui* (L.) (Lepidoptera, Nymphalidae) in the northeast of the Iberian Peninsula. *Miscellanea Zoologica*. 1997; 20:31-48.
7. Stefanescu C. The nature of migration in the red admiral butterfly *Vanessa atalanta*: evidence from the population ecology in its southern range. *Ecological Entomology*, 2001; 26:525-536.
8. Evans WH. The identification of Indian butterflies, 2nd edn. Bombay Natural History Society: Bombay, 1932, 464.
9. Wynter-Blyth MA. Butterflies of the Indian Region. Pages xx + 523, 6 text figures, plates 1-72. Bombay: The Bombay Natural History Society, 1957.
10. Mani MS. Butterflies of the Himalaya. Oxford & IBH Publication Co. Janpath, New Delhi, 1986, 181.
11. Klots AB. Lepidoptera Taxonomist's Glossary of Genitalia in Insects. Ed. 2. Copenhagen, Munksgaard. Tuxen S.L (ed.). 1970, 115-130.
12. Winter WD. Basic techniques for observing and studying moths and butterflies. Lepidopterists Society, New Haven, CT. 2000, 433.
13. Fabricius JC. A Nach Fabricii Systemma Glossatorum. In K. Illiger, Die neuste Gattungs-Eintheilung der Schmetterlinge aus den Linneischen Gattungen Papilio und Sphinx. *Magazin für Insktenkunde*, herausgegeben von Karl Illiger, 6 (article VIII). 1807, 279-289.
14. Latreille PA. Considerations Generates sur l'Ordre Naturel des Animaux Composantles Classes des Crustace's, des Arachnides, et des Insects, 1810, 444.
15. Zimmermann EC. Insects of Hawaii. Volume 7, Macrolepidoptera. 542 pages, 423 text figures. Honolulu: University of Hawaii Press. 1958.