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## WING MACULATION AND GENITALIC VARIATIONS IN *YPTHIMA INICA* (LEPIDOPTERA : SATYRIDAE)

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### INTRODUCTION

The scrutiny of relevant literature shows that the wing maculation variations in the species *Ypthima inica* Hewitson have not been adequately discussed by earlier workers (vide Marshall & de Niveville, 1883; Moore, 1892; Elwes & Edwards, 1893; Evans, 1932; Talbot, 1947; Shirozu & Shima, 1979). The ocelli/eye-like spots are variable in the species. The species is included in the Obscura group of the genus *Ypthima* Hübner (Shirozu & Shima, 1979). Dry-seasons forms (DSF) and wet-season forms (WSF) are found in this species. The dry-season forms are characterized by more angulate wings, the cryptic pattern of underside and the reduced submarginal ocelli, whereas, in wet-season forms the submarginal ocelli on the underside of the wings are well developed. During the course of present studies, besides making detailed observations on the wing maculation variation, the account of the male genitalia which shows unique variation has been updated.

### OBSERVATIONS

The author has examined the wing maculation in, as many as, forty-eight individuals collected from certain habitats of India. In view of the earlier drawbacks, the updated diagnosis of the species is as follows:

#### *Ypthima inica* Hewitson

Common name : The Lesser Threering.

1865. *Ypthima inica* Hewitson, *Trans. ent. Soc. Lond.* 2(3) : 284.  
1874. *Ypthima ariaspa* Moore, *Proc. zool. Soc. Lond.* : 586.  
1883. *Ypthima rara* Butler, *Proc. zool. Soc. Lond.* : 145.  
1886. *Ypthima daedalia* Swinhoe, *Proc. zool. Soc. Lond.* : 422.  
1886. *Ypthima alkibie* Swinhoe, *Proc. zool. Soc. Lond.* : 424.

1886. *Ypthima complexiva* Swinhoe, *Proc. zool. Soc. Lond.* : 424.

*Adult (male)* : Head with frontoclypeal region beset with fulvous and black, hair and scales, lateral rows of white scales and hair; eyes medium sized, dark brown, glabrous; labial palpi three segmented, distal segment slightly longer than proximal segment, middle segment longer, densely clothed with white scales and hair; antenna 11.0 mm, slightly less than half of the wing, club slender, ochraceous, segment longer than broad, nudum extend to the base of flagellum, the latter distal end ochraceous black, incomplete white ring at base of each segment; thorax dorsally dressed with fuscous hair and scales, ventrally with white hair and scales; foreleg with trochanter and tibia subequal, femur less than coxa, tarsus absent, densely studded with black and white scales and hair, meso and meta legs covered with white scales, tibia and tarsi spinose, tarsus clawed; dry season form: upper side dark brown; forewing with small black, bipupilled, yellow-ringed subapical ocellus, submarginal and discal fasciae indistinct, ocelli variable (Table-1), underside whitish grey with brown striations, ocellus as on upperside of forewing, ring more prominent, ocelli variable (Table-1); hindwing upperside with black, yellow-ringed, single pupilled ocellus in Cula, size variable (Table-1), underside brown, striated with white, ocelli absent; wet season form: upperside similar to dry season form except slightly more darker; underside densely striated with greyish white; forewing with subapical, black, bipupilled, broadly ringed with yellow, ocellus, marginal and submarginal fasciae obscure, hindwing with three, black, single pupilled, yellow-ringed ocelli in Rs, Cula, Culb, ocellus in Rs largest, marginal and submarginal fasciae indistinct.

Androconia parallel sided, sharply tapering distally.

*Venation* (Figs. 7-8) : Cell of forewing less than half the length of wing, vein  $R_1$  arising before the upper angle of cell, vein  $M_2$  equidistant between vein  $M_1$  and  $M_3$ , udc minute, oblique, mdc incurved, ldc slightly excurved; hindwing with cell more than half the length of wing, vein Cula well before lower angle of cell, h vein T-shaped.

Abdomen above dark brown, furnished with brown scales, below clad with dusky scales.

*Adult* (Female) : Dry season form : Foreleg developed with tarsus segmented, subapical ocellus on upperside of forewing larger; otherwise as in male; wet season form : foreleg with segmented tarsus, subapical ocellus larger than male; otherwise as in male.

*Male genitalia* (Figs. 1-6) : Uncus subequal to tegumen, weakly curved ventrally, distal end slightly pointed, clothed with sparse setae; tegumen long and broad; fenestrula small, oval, membranous; appendices angulares small, hook-like; vinculum longer than tegumen; saccus small, tubular with rounded distal end; valva with proximal half broader, distal half sharply narrowed, pilose, costa long, sacculus long and narrow, distal end trilobed, ampulla variable (figs. 2, 3); juxta V-shaped; aedeagus long, tubular, narrow at middle in dorsal view, subzone smaller than suprazone, ductus entering dorsad.

*Material examined* : Uttar Pradesh : Aligarh, Kasimpur, 6 ♂, 2 ♀ WSF, 7.ix.2005, (Reg. No. 22913-22920), Coll. N. Sharma; Agra, Bird Sanctuary Keetham, 1 ♂, 1 ♀ WSF, 4.ix.2005, (Reg. No. 22921, 22922), Coll. N. Sharma; Muzaffarnagar, Sukartal, 2 ♂ WSF, 13.ix.2005 (Reg. No. 22924, 22925), coll. N. Sharma; Faizabad, 1 ♂ WSF, 23. ix.1883 (Reg. No. 6666), Coll. de Niceville). Madhya Pradesh : Mhow, Inow, 2 ♂ WSF, 6.v.1882 (Reg. No. 6653-6654) Coll. de Niceville; Mhow, 1 ♂ WSF, 6.x.1881 (Reg. No. 6655), 2 ♀ DSF, xi.1881 (Reg. No. 6656, 6657), 2 ♂ DSF, 6.i.82 (Reg. No. 6658, 6661), 2 ♂ DSF, xii.1881 (Reg. No. 6659, 6660), Coll. de Niceville; Indore, Sagor, 1 ♂ DSF, 12.vii.1886 (Reg. No. 6691), coll. de Niceville. West Bengal : Bholahat, 1 ♀ WSF, 6.iii.1889 (Reg. No. 6662), Coll. W.H. Irvine; 4 ♂ DSF, 25 ♂ WSF, 1.iv.1886 (Reg. No. 6687 to 6690), Coll. de Niceville & W.H. Irvine.

*Remarks* : During the course of present studies, a sample comprising forty-two males and six females (9 ♂, 2 ♀ DSF, 33 ♂, 4 ♀ WSF) have been studied to record variations in wing maculation in the Dry-Season and Wet-Season populations. In view of variations in the dry and wet populations, eight males and three females (3 ♂, 1 ♀ DSF, 5 ♂, 2 ♀ WSF) have been

dissected out and found to agree with each other in every respect except one male genitalia of the specimen collected from Sur Sarovar Bird Sanctuary, Keetham, Agra in which ampulla of the valva is not rounded rather straight in structure (Figs. 2, 3). In fact, in the male genitalia, the valva is quite unique in the entire genus *Ypthima* Hübner, as has been reported by Elwes and Edwards (1893), who however, did not mention anything else about the other constituent parts of the male genitalia. On the basis of present studies it is being suggested that the structure of ampulla be cautiously used taxonomically for providing conspecificity of different individuals of this biological species. Such type of variation has not been seen in any of the fifty-five satyrid species, presently examined. However, Evans (1955) has recorded some variations in the male genitalia of Lycaenid species, *Tarucus nara* (Kollar). Smiles (1982) has remarked that the male and the female genitalia find little assistance in the taxonomy of the Nymphaid genus *Polyura* Billberg. David (1993) has stated that the genitalia are extremely useful taxonomic characters though they diverge rapidly during speciation in some cases. According to him, the most variable portions of the male genitalia are the distal and dorsal margins of the valvae, as has been observed in the satyrid species, *Maniola jurtina* (Linnaeus). Rose and Sidhu (1996) have also reported variations in the valva of lycaenid species, *Aricia agestis* (Denis and Schiffermuller). The species, under reference, also show such type of variation.

#### ABBREVIATIONS USED

1A + 2A : Fused first and second anal veins, 3A : Third anal vein, AED : Aedeagus, APX.ANG. : Appendix angularis, CO : Costa, Cula : Upper branch of first cubital, Cu 1b : Lower branch of first cubital, D : Discal cell, DU.EJ. : Ductus Ejaculatorius, h : Humeral vein, ldc : Lower discocellular,  $M_1$  : First medial vein,  $M_2$  : Second medial vein,  $M_3$  : Third medial vein, mdc : Middle discocellular,  $R_1$  : First radial vein,  $R_2$  : Second radial vein,  $R_3$  : Third radial vein,  $R_4$  : Fourth radial vein,  $R_5$  : Fifth radial vein, Rs : Radial sector, SA : Saccus, SBZ : Subzonal portion of aedeagus, Sc : Subcosta, Sc +  $R_1$  : Stalk of veins Sc and  $R_1$ , SL : Sacculus, SPZ : Suprazonal portion of aedeagus, TEG : Tegumen, udc : Upper discocellular, UN : Uncus, VIN : Vinculum, VLV : valva.

#### SUMMARY

The hitherto unrecorded variations in wing maculation of the species, *Ypthima inica* Hewitson have been recorded in considerable details. In the male

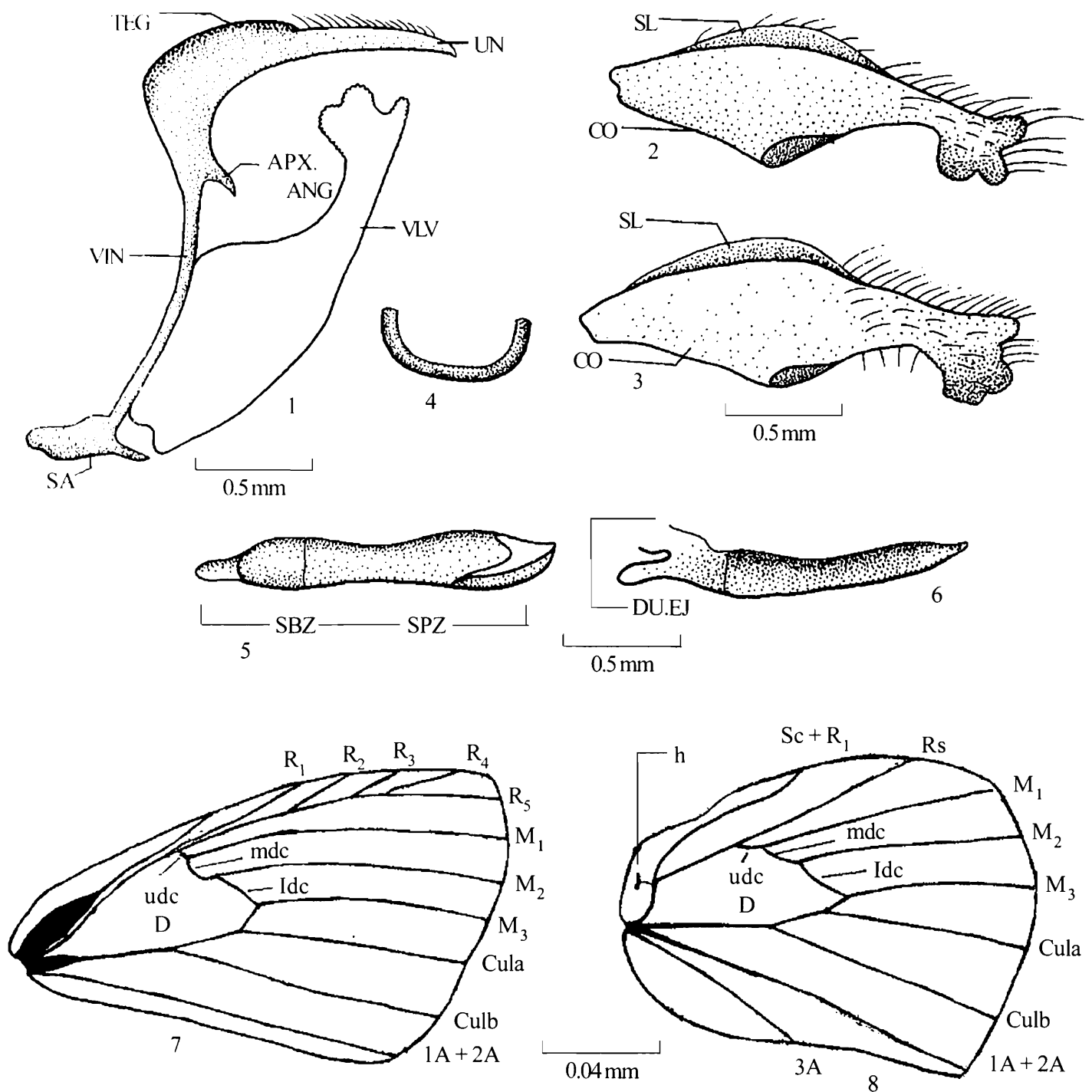


Fig. 1-8 : *Ypthima inica* Hewitson. : 1. Male genitalia (lateral view) 2. Valva (Inner view) 3. Dorsum 4. Juxta (Dorsal view) 5. Aedeagus (dorsal view) 6. Aedeagus (Lateral view) 7. Venation of forewing 8. Venation of hindwing.

genitalia the apex of the valva is variable and inconsistent in this biological species

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**Table 1.** Showing variations in *Ypthima inica* Hewitson

Forewing Upperside (DSF)	a) Subapical ocellus	Rounded (7 specimens)	Oblique (4 specimens)	
	b) Additional Variations	Minute black ocellus present in Cula (1 specimen)	Minute ocellus absent in Cula (10 specimens)	
Hindwing Upperside (DSF)	a) Ocellus in Cula	Moderate in size (8 specimens)	Very small (2 specimens)	Obscure (1 specimen)
Forewing Underside (DSF)	a) Subapical ocellus	Bipupilled (10 specimens)	Tripupilled (1 specimens)	
	b) Additional Variations	Minute ocellus present in Cula in the form of yellow speck (2 specimens)	Minute black ocellus present in Cula (9 specimen)	
Forewing Upperside (WSF)	a) Subapical ocellus	Rounded (27 specimens)	Oblique (10 specimens)	
	b) Yellow ring	Yellow ring surrounding the subapical black ocellus prominent (35 specimens)	Yellow ring surrounding the subapical black ocellus indistinct (2 specimens)	
	c) Subapical ocellus	Bipupilled (36 specimens)	Tripupilled (1 specimen)	
	d) Additional Variations	Minute black ocellus present in Cula (3 specimens)	Minute ocellus absent in Cula (34 specimens)	
Hindwing Upperside (WSF)	a) Ocellus in Cula	Black yellow ringed and single pupilled (35 specimens)	Ocellus in the form of black dot and without pupil (2 specimens)	
	b) Additional Variations	Minute black ocellus present in M <sub>1</sub> (1 specimen)	Minute black ocellus in M <sub>1</sub> absent (36 specimen)	
Forewing Underside (WSF)	a) Ocellus in Cula	Small, black, yellow ringed ocellus present (1 specimen)	Ocellus present in the form of small yellow dot (1 specimen)	Absent (37 specimens)

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