A NEW SPECIES OF ZINASPA FROM CHINA
(LEPIDOPTERA: LYCAENIDAE: THECLINAE)

YU-FENG HSU AND KURT JOHNSON

Dept. of Biology, National Taiwan Normal University, No. 88 Tingchou Road, Sec. 4, Taipei, Taiwan 117, ROC; and Environmental Affairs Dept., The Ethical Culture Society, 53 Prospect Park West, Brooklyn, New York 11215, USA

ABSTRACT.– Zinaspa, a small genus of Arhopalini, is reported from southern China for the first time. A new species, Z. youngi n. sp., is described with brief notes on its host association and myrmecophilism.

KEY WORDS: ants, Arhopala, Arhopalini, Asia, Assam, biology, egg, Formiciidae, Guangdong, hostplants, Hymenoptera, immatures, India, larva, Leguminosae, Malaysia, Myanmar, myrmecophily, Nepal, Oriental, Palearctic, pupa, Sikkim, Sri Lanka, Surenstra, taxonomy, Thaduka, Zinaspa youngi n.sp.

Zinaspa Nicéville is a small genus of Asian "hairstreak" butterflies. Six taxa of Zinaspa have been recognized in previous literature, generally grouped as two species: 1) type species Z. todara Moore (1884) of southern India and Indochina (D'Abreba, 1986) (synonyms: Z. distorta Nicéville (1887) of Myanmar (formerly Burma), Sikkim, Assam and Nepal (Nicéville, 1890; Cantlie, 1963; Smith, 1989), and Z. karenna Evans (1925) of Myanmar); and 2) Z. zana Nicéville (1898) of western China (D'Abreba, 1993) (synonyms: Z. ishikii Koivaya (1989) and Z. neglecta (South, 1913), both from western China). All taxa are tailed at the end of vein Cu_2 of the hindwing, and nothing has been known about their immature stages or host associations.

In China, Zinaspa has been known to occur only in the vicinity of the western provinces. During a biodiversity survey conducted in Nan Ling National Reserve in Guangdong Province, southern China in May, 1997, immatures of Zinaspa were observed by James J. Young at Ru Yang, which is located at the center of the reserve. Emerged adults from these immatures proved to be an undescribed Zinaspa species. Young's discovery represents the first record of Zinaspa in southern China and added new information to the biology of this poorly understood lycaenid genus. We describe this new species in honor of him and briefly report its biology. The details on the life history of this species will be discussed by Young in the near future. Terminology of wing patterns follows Nijhout (1991). The description of genitalia follow Klots (1970).

Zinaspa youngi Hsu & Johnson, new sp.

DIAGNOSIS.– Z. youngi is characterized by the absence of a Cu_2 “tail” on the hindwings, whereas all the other described Zinaspa species possess such a structure. The shape of the hindwings in males of Z. youngi is strongly produced posteriorly, forming a sharp angle at the tornus; other species have a rounded tornus. The wing pattern of Z. youngi is most similar to those of Z. zana described from western China. Notable differences in wing markings between Z. youngi and Z. zana are that Z. youngi has its Cu_4 black dot more prominent and elongate, and much reduced metallic purple patches on wing upperside, covering less than half of both forewing and hindwing. Male genitalia of Z. youngi (Fig. 9) are most similar to that of Z. todara (see Elliot, 1973, fig. 39) but, compared to the latter species, the terminal end of the brachium is sharply pointed (not lobate), the posterior margin of the uncus lobes centrally produced (not flat), the lateral contour of the valva at midpoint far more produced and then abruptly tapered to cucullus and valvula (not of more even contour), and the phallos is hook-shaped with the terminus dorsally inclined (not recurved again ventrally) and lacking apparent cornuti.

The populations of Z. todara of Sumatra are taillles (Eliot, 1992) as in Z. youngi, but Z. todara can be easily distinguished by the rounded shape of its hindwing and by having the proximal band of the central symmetry system on hindwing underside lacking or greatly reduced. DESCRIPTION.– MALE (Fig. 1-2, 9): Length of forewing 16.0mm. Length of antenna 7.5mm. Head: Hairy, clothed with dark brown hairs on vertex and frons; a white, narrow rim surrounding eye; eye semi-oval, with minute hairs; labial palpus hairy, porrect, pointed, projecting anteriorly, covered with gray scaling distally, turning white toward the base; third segment short, 0.2X of entire palpal length; maxillary reduced, invisible; proboscis unscaled; antenna smooth-scaled, naked along inner surface of anterior one-half and at tip of nudum. Thorax: Clothed with gray hairs dorsally, white ventrally. Legs white, banded with gray or black on tibia and tarsi. Foretibia with a tuft of long hairs posteriorly. Foretarsis fused into a single segment with stubby tip, bearing prominent tough setae posteriorly. Forewing: Eleven veins, R_4+5, forked with R_5 at distal one-half of R_5 length; costa slightly curved, termen and dorsum straight. Ground color of upperside dark brown with metallic, deep purple patch present basad. Underside ground color pale brown tinged with purple shine. Submarginal band parallel to termen, forming a series of faint, round spots, outlined by white scaling proximally and distally. Central symmetry system with proximal band absent, distal band forming a straight, narrow, white line outlined by dark brown proximally, parallel to termen but indented in cell Cu_4. Fringe dark brown. Hindwing: Nine separate veins. Tornal area strongly produced posteriorly, forming a tornal lobe. Coloration of upperside similar to those of forewing but with purple patch confined in proximal portion of cell M_1 and Cu_p. Underside ground color pale brown with irregular line patterns. Central symmetry system made up of asymmetrical bands, both with outer white line and inner dark brown outline; color field between the two bands only slightly darker than ground color of wing; proximal band serpentine, close to base in position; distal band irregular in shape, indented in cell Rs, M_1, Cu_p, and 1A, forming straight line or nearly so in cell Sc + R, Rs, M_1, and M_2, curved in Cu_2, Cu_p, and 2A. Submarginal bands consisted of a faint belt of dust-like white scaling, prominent around tornal area, gradually reduced toward costa; "g" element as defined by Nijhout (1991) forming a series of faint lunules proximal to submarginal band. A black dot, proximally crowned by a faint, reddish brown lunule present at inner edge of submarginal band in cell Cu_p. Metallic blue and black scaling present at tornal lobe. A patch of black scaling present at anterior corner along termen. A small, black dot present near distal end of Cu_p. Abdomen: Clothed with gray hairs dorsally, white ventrally. Male genitalia (Fig. 5): Sclerites of 9th and 10th segments fused, forming a complete ring. Tergites 9 + 10 slightly concave posteriorly; posterior end of uncus lobes produced centrally;
Fig. 1-8. *Zinaspa youngi* n. sp. type specimens, immature stages and myrmecophilism: 1) Dorsal view, holotype male; 2) Same, allotype female; 3) Ventral view, holotype male; 4) Same, allotype female; 5) Ova on foodplant, *Acacia sinuata* (Mimosaceae); 6) Enlargement of ovum (scale noted at top); 7) Green onisciform larva (last instar) with associated ants of the genus *Crematogaster*; 8) Lateral view, pupa of *Z. youngi* (scale as in 1).
brachium free, articulated with tegumen, smooth, elongated, strongly bent at half of its length, proximal half thick, attenuate to a distal, pointed end; sacculus produced, approximately 0.22 X height of tegumen; phallosome cylindrical, of hook-like shape, dorsally inclined at posterior and lacking apparent cornuti; valva elongated, conjoined ventrally, laterally very produced at midpoint, then abruptly tapered; costa slightly sclerotized, strongly produced dorsad, ampulla flat, lobe-like, cucullus forming a lobate process, densely setose with long hairs, valvula elongate, inward-directed, forming a sharp point at distal end.

**FEMALE** (Fig. 2, 4, 10): Forewing length 19.0mm; antennal length 8.0 mm. Head: Structure and coloration similar to those of male, but third segment of labial palpus longer, 0.3X of entire palpal length. Thorax: Structure, color patterns similar to those of male, but foretibia without hair tuft as in male; foretarsi not furred, with five segments present. Wings: Shape and coloration similar to male, but upperside without shine, purple patch lighter but duller. Hindwing termen strongly convex, making configuration of hindwing nearly circular in contrast to triangular of male. Coloration of upperside duller, without purple patch; underside with Cu₁ black dot crowned by a prominent orange lunule. Abdomen: Color as described for male. Female genitalia (Fig. 10): Corpus bursae oval, with point of origin of ductus seminalis located between corpus bursae and ductus bursae, close to ostium bursae; double, elongate signa present side by side, forming longitudinal sclerotized bands near distal end of corpus bursae. Posterior end of ostium bursae lightly sclerotized, deeply concave ventral. Lamella postvaginalis asymmetrical, forming a heavily sclerotized terminus surrounded by membranous portions.

**TYPES:** Holotype ♀: CHINA.- Guangdong Province: Ru Yang, emerged 4 Jun 1997, ex Pupa (J. J. Young number 2981). Allotype ♂: same locality as holotype, 13 Jun 1995, Coll. X. C. Chen. Both types deposited in Kadoorie Farm and Botanic Garden of Hong Kong.

**ETYMOLOGY:** This species is named after James J. Young, a lepidopterist long dedicated to life history studies of butterflies.

**BIOLOGY:** The larval host of *Z. youngi* is *Acacia sinuata* (Mimosaceae) (Fig. 5-7). Ovum (Fig. 5-6) is white tinged with pale blue, disk-like, compressed dorso-ventrally, chorion with short spicules and network consisted of radial ridges. Onisicorm larva (Fig. 7) is green with white dorsal chevrons, devouring young leaves and strongly associated with a species of *Crematogaster* ant (Fig. 7). Pupa (Fig. 8) is girdled, brown with mottled dark markings, spiracles white.

**DISCUSSION**

*Zinaspa* is placed along with the genus *Surendra* in the same section within Arhopalini (Eliot, 1973). *Surendra quercetorum* is known to utilize *Acacia caesia* and *A. pennata* as larval host in India and Sri Lanka (Bell, 1915; Woodhouse, 1949), and the larva of *S. vivarna* feeds on *Albizia falcata* (Mimosaceae) in Malaysia (Maschwitz et al., 1985), suggesting Mimosaceae is the ground plan host usage shared by *Zinaspa* and *Surendra*. Larvae of *S. vivarna* have been observed attended by the ant *Anoplolepis longipes* (Maschwitz et al., 1985) and considered "steadily myrmecophilous" by Fiedler (1991). The association between *Z. youngi* and a *Crematogaster* ant was found to be fairly strong. Collected larvae grew poorly without the presence of the ants (Young, pers. comm.), suggesting the same degree of myrmecophilism as in *S. vivarna*. The association with a *Crematogaster* ant, however, is more widespread than with *Anoplolepis* within Arhopalini, with three *Arhopala* and one *Thadika* species known (Fiedler, 1991). Therefore, the *Crematogaster* association of *Z. youngi* could be regarded as a plesiomorphic condition.

Historically, taxonomic study of Chinese Lycanidae has been sparse since the early works of Leech (1893-94). Johnson (1992) revised "elfin-like" hairstreaks of the tribe Eumaeini, documenting numerous species not included in the historical literature. Fujikawa (1992a, 1992b, 1993a, 1993b, 1994a, 1994b) and Kowaya (1989, 1993, 1996) also added additional species to the Chinese hairstreak fauna. Mainland Chinese biologists presently pursuing biodiversity studies acknowledge a high probability that species of Lycanidae still remain to be named from China, both from poorly studied historical material and the results of recent survey collecting. They also emphasize the need for comparative studies of local faunas distinguishing current species diversities and distributions from those indicated when many regions were far less ecologically disturbed (W. Liu, in litt. to Johnson).

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