

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

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ABSTRACT.—*Zinaspas*, 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, Formicidae, Guangdong, hostplants, Hymenoptera, immatures, India, larva, Leguminosae, Malaysia, Myanmar, myrmecophily, Nepal, Oriental, Palearctic, pupa, Sikkim, Sri Lanka, *Surendra*, taxonomy, *Thaduka*, *Zinaspas youngi* n.sp.

Zinaspas Nicéville is a small genus of Asian "hairstreak" butterflies. Six taxa of *Zinaspas* have been recognized in previous literature, generally grouped as two species: 1) type species *Z. todara* Moore (1884) of southern India and Indochina (D'Abrera, 1986) (synonyms: *Z. distorta* Nicéville (1887) of Myanmar (formerly Burma), Sikkim, Assam and Nepal (Nicéville, 1890; Cantlie, 1963; Smith, 1989), and *Z. karennia* Evans (1925) of Myanmar); and 2) *Z. zana* Nicéville (1898) of western China (D'Abrera, 1993) (synonyms: *Z. ishiki* Koiwaya (1989) and *Z. neglecta* (South, 1913), both from western China). All taxa are tailed at the end of vein Cu₂ of the hindwing, and nothing has been known about their immature stages or host associations.

In China, *Zinaspas* 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 *Zinaspas* 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 *Zinaspas* species. Young's discovery represents the first record of *Zinaspas* 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 descriptions of genitalia follow Klots (1970).

Zinaspas youngi Hsu & Johnson, new sp.

DIAGNOSIS.—*Z. youngi* is characterized by the absence of a Cu₂ "tail" on the hindwings, whereas all the other described *Zinaspas* 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 Cu₁ 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 Eliot, 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 phallus is hook-shaped with the terminus

dorsally inclined (not recurved again ventrally) and lacking apparent cornuti.

The populations of *Z. todara* of Sumatra are tailless (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. Foretarsi fused into a single segment with stubby tip, bearing prominent tough setae posteriorly. Forewing: Eleven veins, R₄₊₅ forked with R₃ at distal one-half of R₃ 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 Cu₂. Fringe dark brown. Hindwing: Nine separate veins. Tonal area strongly produced posteriorly, forming a tonal lobe. Coloration of upperside similar to those of forewing but with purple patch confined in proximal portion of cell M₃ and Cu₁. 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, M₁, Cu₂, and 1A, forming straight line or nearly so in cell Sc + R, Rs, M₁, and M₂, curved in Cu₁, Cu₂, and 2A. Submarginal bands consisted of a faint belt of dust-like white scaling, prominent around tonal 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 Cu₁. Metallic blue and black scaling present at tonal lobe. A patch of black scaling present at anterior corner along termen. A small, black dot present near distal end of Cu₁. 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;

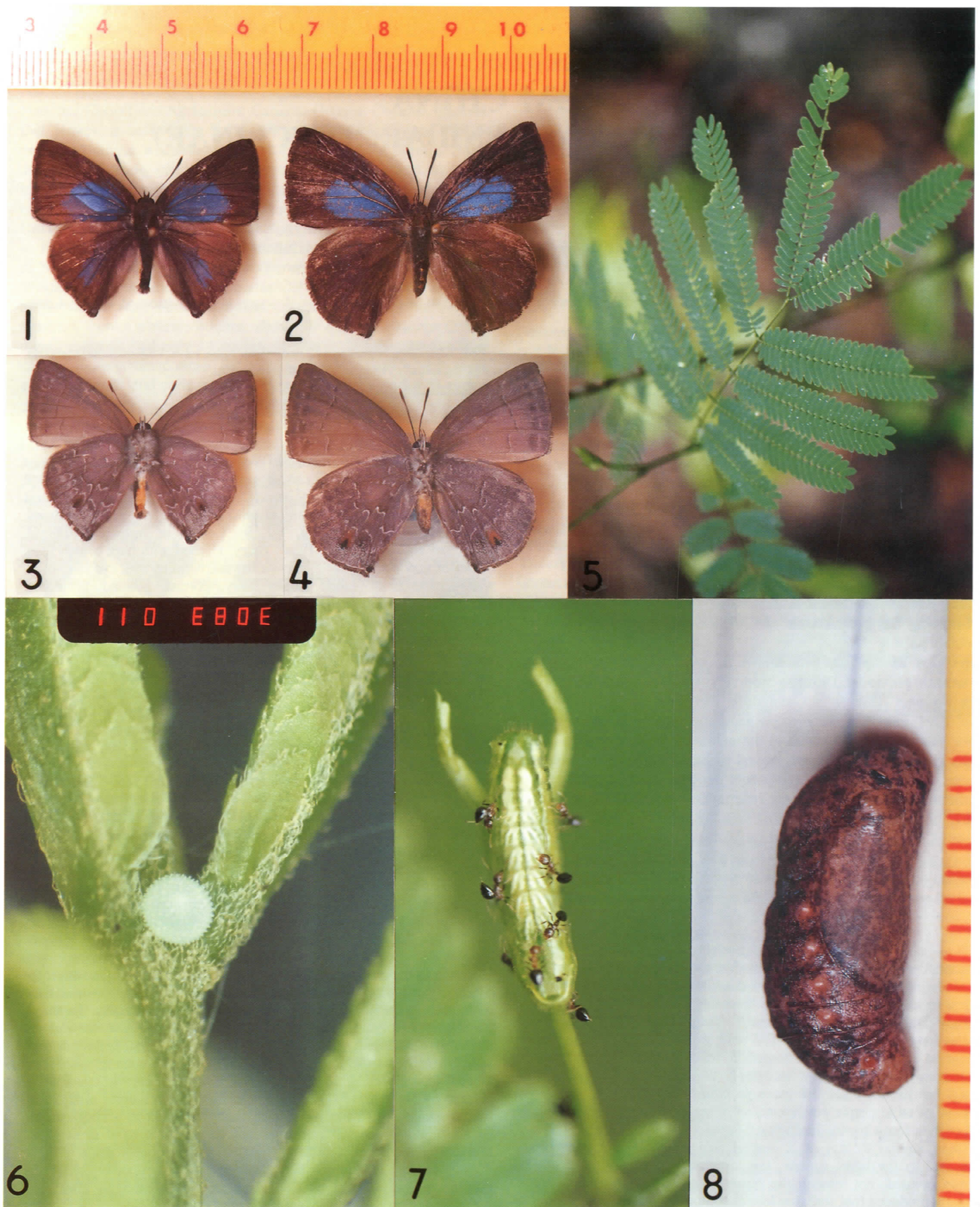


Fig. 1-8. *Zinaspia youngi* n. sp. type specimens, immature stages and myrmecophilism: 1) Dorsal view, holotype male; 2) Same, allotype female; 3) Ventral view, holotype male; 4) Same, allotype female; 5) Ova on foodplant, *Acacia sinuata* (Mimosaceae); 6) Enlargement of ovum (scale noted at top); 7) Green onisciform larva (last instar) with associated ants of the genus *Crematogaster*; 8) Lateral view, pupa of *Z. youngi* (scale as in 1).

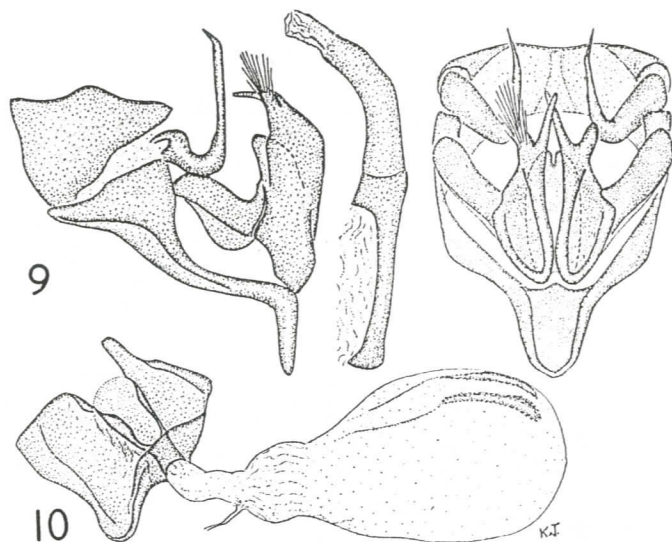


Fig. 9-10. Genitalia of *Zinaspa youngi* n. sp.: 9) Male genitalia, paratype (left, lateral view with aedeagus removed and placed at right; right, ventral view); 10) Female genitalia of paratype (ventral view).

brachium free, articulated with tegumen, smooth, elongated, strongly bent at half of its length, proximal half thick, attenuate to a distal, pointed end; saccus produced, approximately 0.22 X height of tegumen; phallus 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 lightly 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 fused, 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 Cu_1 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 ventrad. 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. Onisciform 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 *Thaduka* species known (Fiedler, 1991). Therefore, the *Crematogaster* association of *Z. youngi* could be regarded as a plesiomorphic condition.

Historically, taxonomic study of Chinese Lycaenidae 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. Fujioka (1992a, 1992b, 1993a, 1993b, 1994a, 1994b, 1994c) and Koiwaya (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 Lycaenidae 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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